



**Environmental Protection Department**  
**Hazardous Waste Management Division**

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**Building 514 Facility  
Contingency Plan**

**April 1996**

**Hazardous Waste Management Division**

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**Lawrence Livermore National Laboratory**  
**University of California Livermore, California 94551**





**Environmental Protection Department**  
**Hazardous Waste Management Division**

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Contingency Plan**

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**Lawrence Livermore National Laboratory**  
**University of California Livermore, California 94551**



# AREA 514 FACILITY CONTINGENCY PLAN

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# **AREA 514 FACILITY CONTINGENCY PLAN**

## **1. INTRODUCTION**

### **1.1 Purpose**

The Area 514 Facility is operated by the Hazardous Waste Management Division at Lawrence Livermore National Laboratory. The contingency plan for the building was prepared to minimize negative impacts to human health and the environment from fires, explosions, and unplanned sudden or nonsudden releases from the building. The releases may be of hazardous, radioactive, or mixed waste constituents to the air, soil, ground water, or surface water, and they may be caused by earthquakes, power outages, or other emergencies.

This plan outlines the responsibilities and procedures to be followed in the event of an emergency at the facility, including those concerning transportation of wastes by Hazardous Waste Management personnel between the Hazardous Waste Management facilities. This plan has been developed in accordance with the requirements of 40 CFR 264 Subparts C and D; 22 CCR 66264.50-66264.56, 66265.50-66265.56; and the LLNL *Draft Emergency Plan*.

This contingency plan is designed to be used in conjunction with the current edition of the LLNL *Draft Emergency Plan*, which is a Laboratory-wide contingency plan that includes implementation procedures for responding to major accidents and disasters (including fires, explosions, hazardous, radioactive, or mixed material or waste spills, and other emergencies that are mitigated by the LLNL Fire Department). Both the *Draft Emergency Plan* and the *Emergency Plan Implementation Procedures* will be referred to collectively as the *Draft Emergency Plan* throughout this document.

### **1.2 Scope of the Plan**

This contingency plan was prepared specifically for the Area 514 Facility. This Plan identifies personnel responsibilities, emergency equipment, and required actions necessary to mitigate accidents within this facility. It is intended to instruct and prepare Hazardous Waste Management Division personnel for potential emergencies.

The Plan specifically defines which types of emergencies must be mitigated by the LLNL Fire Department and those that may be remedied by Hazardous Waste Management Division personnel. This is accomplished by classifying the particular accident in accordance with the following four incident levels:

- Level 1 incident (no emergency): A Level 1 incident is a minor problem or incident not involving emergency response units external to the Hazardous Waste Management Division. This type of incident may be characterized by a minor injury requiring first-aid treatment or a minor hazardous, radioactive, mixed waste, or toxic release. The

Hazardous Waste Management Area 514 Facility Operations  
Supervisor acts as the Incident Commander.

- Level 2 incident (minor emergency): A Level 2 incident may be a single fire, a moderate hazardous, radioactive, mixed waste, or toxic release or an injury requiring medical treatment. The LLNL Fire Department Chief acts as the Incident Commander. The Laboratory Emergency Duty Officer is informed.
- Level 3 incident (major emergency): A Level 3 incident includes emergencies such as multiple fires; an explosion; a large hazardous, radioactive, or mixed material (waste) release; or a moderate earthquake. An incident at this level would require site-wide commitment and management of LLNL resources. The LLNL Laboratory Emergency Duty Officer (LEDO) is in charge of the overall incident. The Incident Commander (LLNL Fire Chief) is in charge of the incident scene.
- Level 4 incident (disaster): A Level 4 incident includes emergencies such as a severe earthquake, major fire, major hazardous, radioactive, or mixed material (waste) release with off-site effects, or an explosion with major damage. These incidents cause extensive injuries, death, property damage, and/or security problems. The Crisis Manager is in charge of the overall incident. The Incident Commander (LLNL Fire Chief) is in charge of the incident scene. The facility-specific self-help plans are activated in a Level 4 incident. These emergency response plans provide additional guidance in response to major emergencies.

Hazardous Waste Management Division personnel may respond to a Level 1 incident without notifying the LLNL Fire Department. This contingency plan need not be implemented for Level 1 incident mitigation.

<p><b>The LLNL Fire Department must be called whenever a Level 2, 3, or 4 incident occurs. Call ext 911.</b></p>
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### 1.3 Implementation of the Plan

Provisions of this contingency plan are intended to minimize hazards to human health and the environment. This Plan is implemented whenever an incident occurs that requires intervention from the LLNL Fire Department. These incidents are classified as Level 2, 3, or 4.

Hazardous Waste Management Division personnel must first decide if an incident exceeds a Level 1 classification. Criteria were developed to help them make this determination. A Level 1 incident is exceeded and the Fire Department must be called if any one or more of the following conditions occurs:

- Fire
- Releases of materials or wastes with properties unfamiliar to Hazardous Waste Management Division personnel
- Release of materials or wastes that cannot be identified
- Release that cannot be cleaned up or contained and controlled by two individuals in one hour
- Incidents resulting in injuries requiring medical treatment
- Incidents requiring complete evacuation of a building or the facility
- Any incident regarded by personnel as unsafe to manage in-house
- Released hazardous, radioactive, or mixed material or waste migrating outside the Hazardous Waste Management Facility boundary.

Response procedures for Level 1 incidents are included in this document to provide guidance for Hazardous Waste Management Division personnel.

#### **1.4 Maintenance of the Plan**

A current copy of this contingency plan is maintained at the Area 514 Facility, the Hazardous Waste Management Division office, the LLNL Fire Department, the Health Services Department, and the Safeguards and Security Department. Copies are submitted to all appropriate off-site police, fire, and emergency response agencies (see Section 5).

The Plan will be amended, as necessary, to ensure that it is current and reflects actual facility response practices. This contingency plan is routinely reviewed by Hazardous Waste Management Division on an annual basis. The Plan is immediately amended whenever:

- The LLNL Resource Conservation and Recovery Act (RCRA) Part B permit application is revised or the issued permit is significantly modified
- Applicable federal regulations are revised
- The contingency plan fails in an emergency
- The Area 514 Facility changes its design, construction, operation, maintenance or other circumstances in a way that increases the potential for fires, explosions, or releases of hazardous, toxic, radioactive, or mixed waste, or changes the response necessary in an emergency

- The list of emergency coordinators changes
- The list of emergency equipment changes.

An amended Plan is distributed to all appropriate internal and external agencies.

## **2. FACILITY DESCRIPTION**

This section of the contingency plan includes a basic description of the Area 514 Facility, a site plan, and a brief description of facility operation and treatment units.

### **2.1 Basic Description**

EPA ID No:

CA 2890012584

Site Operators:

Regents, University of California

U. S. Department of Energy

Mailing Address:

Lawrence Livermore National Laboratory

P.O. Box 808

Livermore, CA 94551

Facility Name:

Area 514 Facility

Division:

Hazardous Waste Management Division

Department:

Environmental Protection Department

Location:

7000 East Avenue

Livermore, CA 94551

Contact:

Dennis K. Fisher

Associate Director, Plant Operations

Address:

Lawrence Livermore National Laboratory

P.O. Box 808 (L-668)

Livermore, CA 94551

(510) 422-3343

Owner:  
U.S. Department of Energy

Address:  
Department of Energy  
Oakland Operations Office  
1301 Clay Street, Suite 700N  
Oakland, CA 94612-5208

Contact:  
James T. Davis  
Assistant Manager for Environmental Management and Support  
Department of Energy, Oakland Operations Office  
Oakland, CA 94612-5208  
pH.: (510) 637-1587

## **2.2 Site Plan**

The Area 514 Facility is located in the southeast area of the LLNL Main Site, close to the Area 612 Facility (see Figure 2-1).

### **2.2.1 Cross Reference**

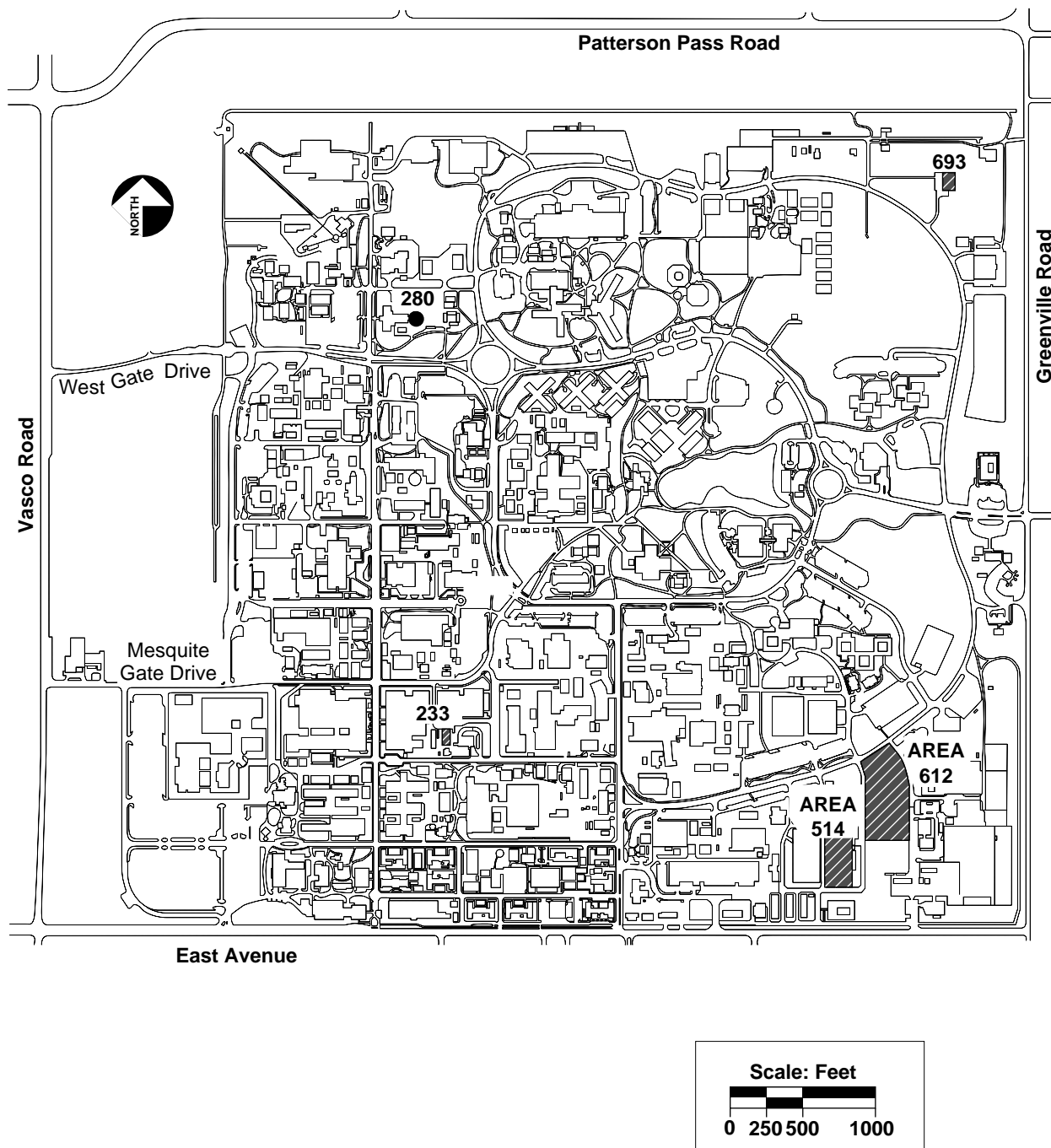
The Part B permit application includes designations for specific hazardous waste management units that are different from the units' building designations assigned by LLNL. The hazardous waste management unit designations were created to simplify the permit application. A cross reference identifying the hazardous waste management unit designations specified in this permit application and the units' corresponding building designations are provided below. For hazardous waste management unit designations that are not identified below, the permit application uses the same designation as the corresponding LLNL building designation.

#### **Part B Designation**

Area 612-1 Container Storage Unit  
Area 612-4 Container Storage Unit  
Area 612-5 Container Storage Unit  
Area 514-3 Container Storage Unit  
Area 514-1 & 514-2 Container Storage Units

#### **LLNL Building Designation**

Building T6197 & T6198 (Tents)  
Building 612A  
Building T6197B (Tent)  
Building 514A  
Building 513A



**Figure 2-1. LLNL Main Site Map Showing Locations of the Hazardous Waste Management Facilities**

## 2.3

### Facility Operations

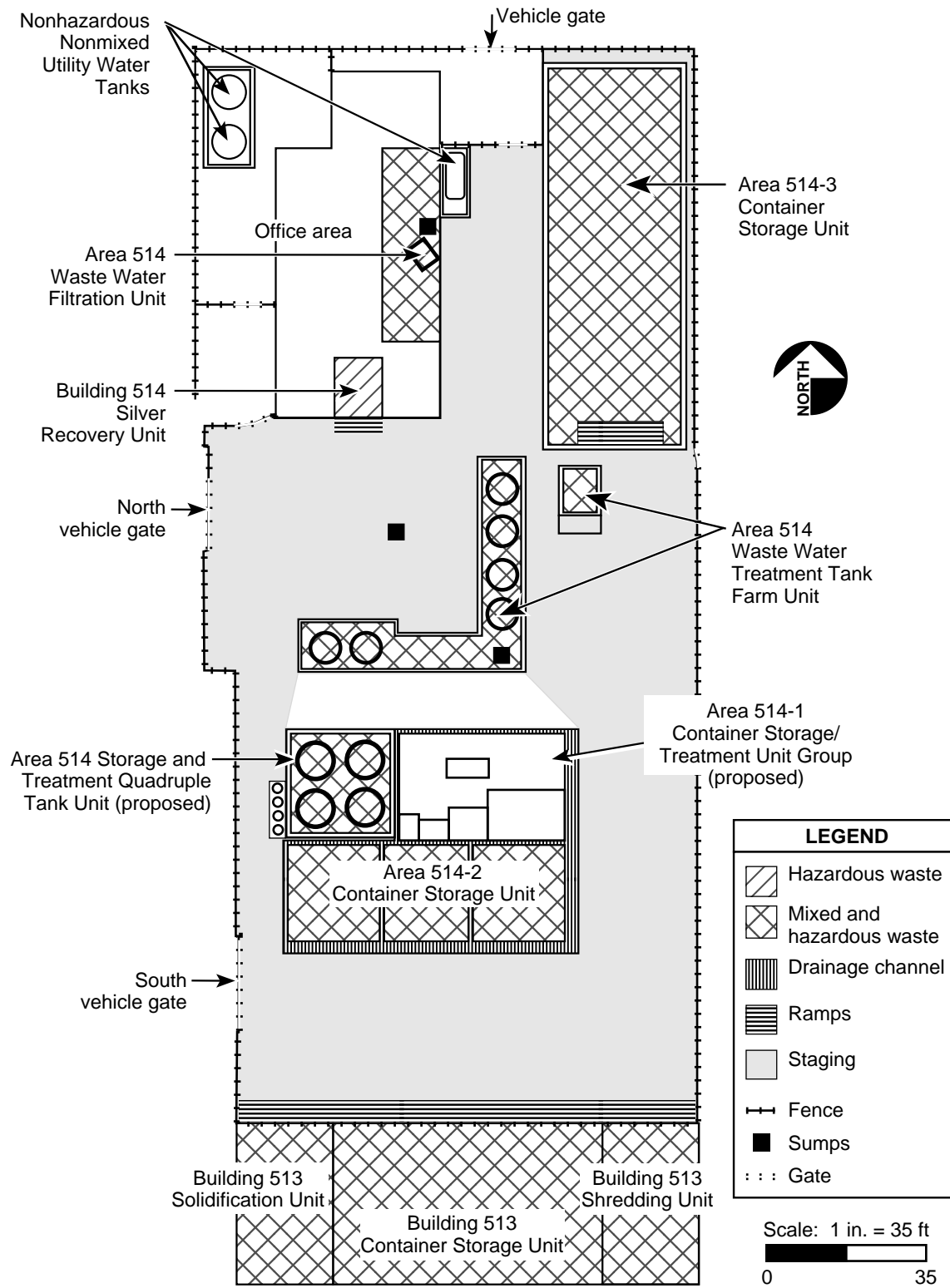
The Area 514 Facility (see Figure 2-2) is one of four Hazardous Waste Management Facilities which contain waste management units subject to permitting requirements. The other three are the Area 612 Facility, Building 693 Container Storage Unit, and Building 233 Container Storage Unit. Each hazardous waste facility area has specific contingency plans applicable to their area. The Area 514 Facility is designed to manage hazardous, radioactive, and mixed waste generated by LLNL's research and support organizations. Waste streams include, but are not limited to: spent plating solutions, rinse waters, machine shop wastes, acids, caustics, photographic chemicals, solvents, oils, and miscellaneous laboratory solutions and chemicals.

The Area 514 Facility handles mostly low-level radioactive and mixed waste streams. However, the Building 514 Silver Recovery Unit does treat nonradioactive photochemical wastes. The wastes managed at this facility are regulated under the following agencies: the U.S. Environmental Protection Agency (EPA), California State Department of Toxic Substances Control (DTSC), California Department of Health Services (CDHS), and the U.S. Department of Energy (DOE).

Specific activities conducted in the Area 514 Facility involve the bulking and blending of wastes into treatment tanks; treatment of liquid hazardous, toxic, mixed and low-level radioactive wastes (neutralization, metal chelation, decanting, pH adjustment, precipitation, carbon adsorption, and filtration); centrifugation; evaporation; solidification; shredding; silver recovery operations; and container storage.

The waste management units located in the Area 514 Facility include the following:

- Building 513 Solidification Unit
- Building 513 Shredding Unit
- Building 513 Container Storage Unit
- Building 514 Silver Recovery Unit
- Area 514 Waste Water Filtration Unit
- Area 514 Waste Water Treatment Tank Farm Unit
- Area 514-1 Container Storage Unit
- Area 514-1 Cold Vapor Evaporation Unit (proposed)
- Area 514-1 Portable Blending Unit (proposed)
- Area 514-1 Tank Blending Unit (proposed)



**Figure 2-2. Area 514 Facility**

- Area 514-1 Centrifugation Unit (proposed)
- Area 514-1 Carbon Adsorption Unit (proposed)
- Area 514-2 Container Storage Unit
- Area 514-3 Container Storage Unit and
- Area 514 Storage and Treatment Quadruple Tank Unit (proposed in late 1995)

### **3. HAZARD PREVENTION**

This section outlines various hazard prevention efforts. Specifically, the LLNL approaches for preventing hazardous run-on and run-off, releases to the atmosphere, and undue exposure to employees are discussed.

#### **3.1 Run-On and Run-Off Control—Hazard Prevention**

Although LLNL is not located in a flood zone, the Area 514 Facility contains run-on control structures to protect hazardous, toxic, radioactive, and mixed waste management units from storm water. These include: berms; grades that slope away from the units; roofs or structures over units; and storm drains. Berms are engineered structures that may be curbing, foundations, and ramp systems. Run-off control structures such as berms are located at the Area 514 Facility to control releases and collect rain water that may be contaminated with hazardous residues. Each liquid container storage unit is equipped with secondary containment that is impervious to the stored wastes and is sloped so that any surface run-off or releases will accumulate in a given area to facilitate liquid removal operations.

Accidental spillage of radioactive or hazardous materials within bermed areas is removed in a timely manner. All liquids captured in the basins, including rain and rinse water, are sampled and analyzed in accordance with Part III.3.6.12 of the Part B permit application, unless the source of a Release is readily traceable to a particular container. Since the contents of the container are known and are on record, waste sampling and analysis is not necessary.

#### **3.2 Releases to the Atmosphere—Hazard Prevention**

All employees handling hazardous, radioactive, or mixed wastes are required to conform to the guidelines expressed in the Hazardous Waste Management Facility Safety Procedures (FSPs) and Standard Operating Procedures (SOPs). Hazardous gases, mists, or vapors is minimized or prevented by following the waste handling procedures and by:

- Using hoses and locking connections for transfer of wastes from tanker trucks or containers into treatment tanks and containers

- Inspecting waste containers on a routine basis to detect releases, leaks, or integrity problems that could result in waste releases (these routine inspections provide for timely detection and mitigation of such releases)
- Some containers are fitted with venting devices (e.g., carbon absorption containers).
- Administratively controlling waste bulking operations to avoid potential mixing of incompatible wastes in containers
- Segregating containers of incompatible wastes
- Keeping containers closed except when adding or removing waste
- Proper selection of container type that is compatible with the waste.
- Using high-efficiency particulate air (HEPA) filters on hazardous, mixed, and radioactive process exhausts (e.g., the Building 513 Treatability Study Laboratory Hood and Building 513 Shredding Unit)
- Using a carbon adsorption system on the 514 Storage and Treatment Quadruple Tank Unit (proposed).

In the event of an accidental release to the environment, Release response would be implemented and, if the incident is declared Level 3 or greater, the LLNL Atmospheric Release Advisory Capability (ARAC) system would be utilized. The LLNL ARAC system would also be activated for an air release greater than the CERCLA Reportable Quantity, or if an LLNL Industrial Hygienist determines that an on-site release has an effect off-site.

ARAC is a system designed to estimate the effects and atmospheric dispersion of hazardous and radioactive waste releases within the immediate area surrounding a release or within Northern California. The ARAC Central Facility is equipped to perform detailed atmospheric dispersion calculations, allowing an accurate tracing of hazardous and radioactive waste dispersion. The capability of this system allows the various response teams to have information on any hazardous and mixed waste (radioactive material) concentrations resulting from an accidental release.

Additional near-event dispersion calculations are available from the LLNL Hazards Control Industrial Hygiene Group.

### **3.3 Undue Exposure to Employees—Hazard Prevention**

Personnel are protected from undue exposure to hazardous, toxic, radioactive, and mixed waste by administrative controls, following written procedures, personal protective equipment, and engineered controls. Medical evaluations are conducted on a regular basis for HWM personnel working within the hazardous waste facilities.

### 3.3.1 Administrative Controls

Any new potentially hazardous operation must be thoroughly evaluated by the LLNL Hazards Control Department prior to commencement. Procedures for the safe handling of specific chemicals and groups of chemicals are described in Chapter 21 of the LLNL *Health and Safety Manual*.

Operations at the Area 514 Facility are conducted using approved written procedures. Facility Safety Procedures (FSPs) are the basic safety ground rules to be followed by all personnel present within a building or area. FSPs are reviewed every three years. FSP-514, *Radioactive and Hazardous Waste Treatment Facility: Building 514 Complex*, includes:

- A description of an anticipated activity and its hazards and risks
- The name of the individual responsible for ensuring compliance with the FSP
- Instructions to be followed to implement the controls that will reduce the risks to an acceptable level
- Information concerning any special conditions that may be present.

Each LLNL employee assigned to the Area 514 Facility is required to read FSP-514. The FSP planning and preparation process is described in the LLNL *Health and Safety Manual*, Chapter 2, “Work Planning and Safety Procedures.” In addition, as part of HWM’s Training Program, each HWM employee is a participant in the HWM Reading Program, which requires personnel to read FSPs, contingency plans, and self-help plans.

In addition to the broad safety guidelines presented in the FSP, safety requirements specific to a hazardous waste operation are presented in Hazardous Waste Management Division Operational Safety Procedures (OSPs) and Standard Operating Procedures (SOPs). Hazardous Waste Management Division personnel must be familiar with each procedure applicable to a given operation before performing the work.

Personnel handling waste must also complete specialized training in accordance with 29CFR1910.120 and T22-66264.16 and T22-66265.16. The 24-hour HAZWOPER course is mandatory, in addition to the eight-hour annual refresher course. The On-the-Job Training (OJT) Program and other specialized training courses must be completed by Hazardous Waste Management Division Operations Technicians and Technologists. For details, see Part VII and Part VIII of the Part B permit application.

All programs, facilities, and buildings are subject to audits and evaluations by Hazards Control personnel. Results of these audits are forwarded to the appropriate department so that any deficiencies can be corrected. Hazards Control personnel also review the effectiveness of the ES&H teams and other Hazards Control services to ensure that they

are providing the proper support to operating personnel. Records of these audits are maintained by Hazards Control.

### 3.3.2 Personal Protective Equipment

Safety glasses and solid-toe shoes are required to be worn at all times when working in waste management operational areas. Booties are worn over shoes for certain activities, such as decontamination, or in designated areas where radioactive containers are opened. Coveralls or equivalent are required to be worn at all times by operators handling waste containers. Leather, acid-, base-, or solvent-resistant gloves are worn as appropriate for the waste handling activity. Face shields, goggles, or other facial and eye protection is required to be worn in accordance with the FSPs and OSPs when handling open containers of liquid waste.

Employees are issued respirators with filter cartridges based on information provided in a specific procedure or under the direction of an Environmental, Safety, and Health (ES&H) Team Industrial Hygienist or Health Physicist. A Level A, B, C, or D respirator is assigned based on the type of activity.

If specified PPE is not available at the facility, and no approved substitute is available, then work is delayed until adequate equipment is obtained. For more details on PPE available at the facility, see Section 7.4.4. For information on Personal Protective Equipment Guidelines, See Appendix A.

### 3.3.3 Engineered Controls

Engineered controls were devised to prevent personnel exposure to hazardous, toxic, and mixed constituents. The Building 514 Treatability Study Laboratory Hood is equipped with a HEPA filter. The Building 514 Shredding Unit also contains a HEPA filter. Criteria for use of hoods and enclosures when radioactive or hazardous materials are being handled are outlined in the *LLNL Health and Safety Manual*, Chapter 33, "Radiation-Ionizing"; Manual Supplement 33.42, "Workplaces for Radionuclides"; and Manual Supplement 12.03, "Work Enclosures for Toxic and Radioactive Materials." In addition, the following is observed.

- Exhaust flow is tested by Hazards Control personnel on a scheduled basis; air flow indicators are utilized to confirm that exhaust fans are operating adequately whenever a hood or enclosure is used
- HEPA filters on hoods and enclosures are tested for filtering efficiency on a scheduled basis by Hazards Control personnel.

Other engineering controls that serve to protect personnel from exposure are:

- Use of controlled closed piping and hoses that transfer waste from tanker trucks and containers to receiving tanks and storage containers

- The interlock system on the shredder that concentrates waste spillage into the hopper (and thus exposure to wastes is avoided)
- Transfer pumps have an interlock system which is designed to prevent overfill of tanks and, hence, exposure to personnel
- Building 513 has turbine air ventilators in the roof to provide sufficient ventilation, which reduces formation of gases, mists, and vapors.

Many of the waste container storage areas (e.g., 514-1, 514-2, 514-3) and the Area 514 Wastewater Treatment Tank Farm Unit have open air ventilation. Roll-up doors are installed at the Building 513 Container Storage Unit. Electronic gates provide manual and automatic access to the Area 514 Facility. Lighting is installed within the Building 514 (rooms 105 and 108) and Building 513 Container Storage Unit. Emergency eyewash and showers are present throughout the Area 514 Facility.

The hazardous waste container units within the Area 514 Facility have been constructed to minimize the potential for accidental releases and run-on of rainwater. Most of these waste container units have sloping extension grades and some with interior ramps. Berms have also been installed to prevent rainwater run-on and to help in segregating any accidental releases. Berms are curbing, foundations, and ramp systems.

Forklifts are used to move large loads on pallets or skids. Drum dollies are used to move individual drums. Ramps and elevated grades were constructed to facilitate the ease and safe access of forklifts and other equipment bearing waste containers to the treatment and storage units. This construction helps prevent hazards in unloading operations and consequent undue exposure of personnel to hazardous, radioactive, or mixed waste releases.

#### **4. RESPONSIBILITIES DURING AN EMERGENCY**

This section presents the responsibilities of Hazardous Waste Management Division emergency response staff and support organizations in addition to the LLNL Emergency Response Organization. Individuals designated in Table 4-1 may be selected as Emergency Coordinator during an emergency incident. For Level 1 incidents, the Area 514 Facility Supervisor or designated alternate is the Emergency Coordinator; for Level 2, 3, or 4 incidents, a Fire Chief is the Emergency Coordinator.

**Table 4-1. Emergency Call List**

<b>Hazardous Waste Management Division*</b>		<b>Duty Fire Chiefs†</b>			
Title	Facility Supervisor	Fire Chief (primary)	Assistant Fire Chief (alt. 1)	Assistant Fire Chief (alt. 2)	Assistant Fire Chief (alt. 3)
Name	Scott Kidd	John Sharry	John Loverin	Jerry Sandoval	Ralph Buntlin
Dial Page	37777-01228	37700-01800	37700-01802	37700-01804	37700-01803
Work Phone	(510) 422-1253	(510) 423-1800	(510) 423-1802	(510) 423-1804	(510) 423-1803
Work Address	7000 East Ave. Livermore, CA 94551	7000 East Ave. Livermore, CA 94551	7000 East Ave. Livermore, CA 94551	7000 East Ave. Livermore, CA 94551	7000 East Ave. Livermore, CA 94551
L-Code	L-620	L-388	L-388	L-388	L-388
Home Phone	(510) 757-1032	(510) 373-1926	(510) 447-6855	(510) 443-0797	(408) 475-3840
Home Address	216 Brookside Dr., Antioch, CA 94509	5116 Teresa Way Livermore, CA 94550	1865 DeVaca Way Livermore, CA 94550	5175 Irene Way Livermore, CA 94550	615 Burlingame Ave., Capitola, CA 95010
Note: For assistance during off-shift hours, contact Fire Department Dispatcher on ext 911.					

\*Emergency Coordinator for Level 1 Incidents.

†Emergency Coordinator for Level 2, 3, or 4 Incidents.

#### **4.1 Emergency Coordinator (LLNL Incident Commander)**

The LLNL Incident Commander fulfills the responsibility of Emergency Coordinator pursuant to State and Federal regulations. The Incident Commander coordinates all emergency responses.

Level 1 incidents are handled by the Hazardous Waste Management Division with the Area 514 Facility Operations Supervisor or alternate as the Incident Commander. He or she is responsible for assessing emergency conditions, safeguarding Area 514 Facility personnel, making the initial emergency classification, initiating on-site response activities, and requesting help from support organizations. He or she coordinates all emergency response measures and has the authority to commit resources needed to mitigate Level 1 incidents as described in this contingency plan. Response procedures for Level 1 incidents are included in this document to provide guidance for Hazardous Waste Management Division personnel. This contingency plan is not considered to be implemented for Level 1 incident mitigation.

For Level 2, 3, and 4 incidents, the Fire Department is contacted. For these emergencies, the first or senior Fire Department Officer dispatched to or present at the incident site becomes the Incident Commander until relieved by a Chief Officer. The Chief

Officer then becomes the Incident Commander. The Incident Commander is responsible for assessing the emergency conditions, making the initial emergency level classification, initiating on-site response activities, and requesting support from off-site organizations. On-scene operational control for life, safety, rescue, fire control and extinguishment, release control, decontamination zones, and containment, and property conservation and salvage is provided by the Incident Commander at all times. He or she also directs the efforts of the Emergency Response Organization to identify material released and to assess potential or actual health consequences. The Incident Commander coordinates all emergency response measures and has the authority to commit resources needed to carry out this contingency plan and the LLNL *Draft Emergency Plan*.

Personnel qualified to act as Incident Commander are always on the premises. The LLNL Fire Department maintains a 24-hour staff and is available to assume the role of Incident Commander at all times, for all level incidents.

## **4.2 Hazardous Waste Management Division Emergency Contacts**

Hazardous Waste Management Division personnel are prepared to respond in an emergency, including the Area 514 Facility Supervisor, Operations Technicians and Technologists, and Waste Operations Section Leader. Other Hazardous Waste Management Division personnel with responsibilities that affect the emergency response capability include the Support Services Supervisor and the Facilities and Assessments Section Leader.

For Level 1 incidents, Hazardous Waste Management Division can request assistance from the emergency support organizations, which include: the Hazards Control ES&H Team, the Environmental Operations Group Environmental Analyst, and the Wastewater Guidance and Monitoring Group.

The Hazardous Waste Management Division also provides equipment and personnel to support the Incident Commander (Fire Chief), when requested, for Release containment and cleanup during Level 2, 3, and 4 incidents occurring on-site. The Hazardous Waste Management Division maintains a ready supply of emergency response equipment in a specially equipped release response trailer.

### **4.2.1 Hazardous Waste Management Division Area 514 Facility Supervisor or Alternate**

Specifically, the following are the responsibilities of the Hazardous Waste Management Division Facility Supervisor (or alternate) for all emergency incidents in the Area 514 Facility:

- For Level 1 incidents:
  - Maintains own safety and that of all personnel in the area
  - Acts as the Incident Commander, as described in Section 4.1

- Ensures that the Environmental Operations Group Environmental Analyst and the Health and Safety Technician have been notified
- Ensures that all normal waste handling operations cease in areas within and bordering the release until cleanup procedures are completed to avoid contact of incompatible waste with released material
- Directs the collection and containment of released wastes and the removal or isolation of incompatible waste containers
- Ensures that all releases are internally reported by Hazardous Waste Management Division Operations Technicians/Technologists
- Monitors for leaks, pressure build-up, gas generation, or ruptures in valves, pipes or other equipment, wherever applicable
- Provides for treatment, storage, or disposal of recovered hazardous, radioactive, or mixed wastes or material, contaminated soil, or surface water, in accordance with all applicable regulations
- Ensures that all emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.
- For Level 2, 3, and 4 incidents:
  - Evaluates the immediate scope of the incident
  - Initiates evacuation of facility personnel, if necessary (activates Area 514 Facility paging system)
  - Notifies the LLNL Fire Department
  - Takes appropriate action to safeguard Area 514 Facility personnel
  - Ensures that the Environmental Operations Group Environmental Analyst and the Health and Safety Technician have been notified
  - Directs area personnel in accordance with the FSPs and contingency plan as temporary Incident Commander until the Fire Department and the official Incident Commander arrive
  - Ensures that all normal waste handling operations cease in areas within and bordering the release until cleanup procedures are completed to avoid contact of incompatible waste with released material

- Assists the Incident Commander and provides appropriate direction to Area 514 Facility personnel who are lending support
- Ensures personnel and equipment are properly decontaminated
- Ensures that all Hazardous Waste Management Division emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.
- Preventative maintenance responsibility:
  - Ensures that all emergency response equipment and spill kit contents are properly maintained, sufficiently stocked, and in good working order.

#### 4.2.2 Hazardous Waste Management Division Operations Technicians and Technologists

The following are the responsibilities of the Operations Technicians and Technologists during an emergency incident:

- For a Level 1 incident:
  - Maintain own safety
  - Observe the two-person rule—never work alone
  - For release response, follow the Ten-Step Plan (described in Section 6.2.6); listen carefully to instructions from the Incident Commander (Area 514 Facility Operations Supervisor or alternate)
  - Immediately report any injuries, incidents, and unsafe conditions to the Incident Commander
  - Stop any Hazardous Waste Management Division release cleanup operation when there appears to be danger to personnel, property, or the environment, and should notify the Incident Commander and Facility Supervisor for assistance
  - Ensure that Level 1 releases are internally reported.
- For Level 2, 3, and 4 incidents:
  - Maintain own safety
  - Notify Area 514 Facility Supervisor or alternate (in case of extremely hazardous, life threatening situation, immediately notify facility personnel on the Area 514 Facility paging system)

- For Level 2, 3, or 4 releases, if safe, follow the first five steps of the Ten-Step Plan (described in Section 6.2.6) while waiting for the LLNL Fire Department to arrive
- Observe the two-person rule—never work alone
- Provide assistance to the Incident Commander (LLNL Fire Chief), as requested, for release cleanup
- Listen carefully to instructions from the Incident Commander and Area 514 Facility Supervisor
- Ensure that release residue and contaminated disposable clothing and equipment are discarded appropriately
- Ensure that all incidents are properly documented in daily inspection logs.

#### 4.2.3 Hazardous Waste Management Division Waste Operations Section Leader

The following are the responsibilities of the Waste Operations Section Leader during an emergency incident:

- Coordinates remediation efforts as directed by the Incident Commander or the Environmental Operations Group Environmental Analyst
- Provides technical support to the Emergency Control Organization regarding Hazardous Waste Management Facilities and operations
- Ensures that any reportable release is properly documented and notification is given to the Environmental Protection Department management.

#### 4.2.4 Hazardous Waste Management Division Support Services Supervisor

The Hazardous Waste Management Division Support Services Supervisor is responsible for maintaining the operational readiness of the emergency equipment at the Area 514 Facility to ensure proper working order.

#### 4.2.5 Hazardous Waste Management Division Documents and Assessments Group Leader

The Hazardous Waste Management Division Documents and Assessments Group Leader is responsible for preparing, reviewing, and updating the contingency plan.

## **4.3 Support Organizations**

### **4.3.1 Hazards Control ES&H Team**

Members of the Hazards Control ES&H Team may be called in to advise and support the Hazardous Waste Management Division in mitigating Level 1 emergency incidents. This team consists of specialists in the following fields: Industrial Hygiene, Industrial Safety, Health Physics, Environmental Protection, Explosives Safety, Fire Protection Engineering, and Criticality Safety.

The Incident Commander for Level 2, 3, and 4 incidents can also call on the Hazards Control ES&H Team as provided above for professional advice and, in addition, can activate the Hazard Control Satellite Operations Center and the Emergency Management Center (EOC) if additional support is needed. This organization is described in more detail in the LLNL *Draft Emergency Plan*.

#### **4.3.1.1 Hazards Control ES&H Team Leader**

The following are the responsibilities of the Hazards Control ES&H Team Leader or alternate. For Level 1 incidents:

- Helps dispatch the appropriate Hazards Control Department representative to advise and support Hazardous Waste Management Division in mitigating Level 1 emergency incidents (this includes, but is not limited to, an Industrial Hygienist for chemical hazards assessments and PPE advice, and a Health Physicist for assessment and advice regarding released radioactive or mixed wastes).

For a Level 2, 3, or 4 incident:

- Assembles the ES&H Team at the Command Post or at a specified Assembly Area
- Relays the field status of the emergency response to the Incident Commander
- Coordinates team member responses in their respective disciplines
- Provides a unified assessment of field conditions and actual or potential health effects based on team member evaluation of the incident
- Establishes proper level of PPE based on evaluations
- Establishes levels of contamination
- Advises the Emergency Response Organization on appropriate protective measures based on field evaluations.

#### 4.3.1.2 Environmental Operations Group Environmental Analyst

The Environmental Operations Group Environmental Analyst represents the Environmental Protection Department on the Hazards Control ES&H Team. This individual supports the Hazardous Waste Management Division. During an incident (Levels 1 through 4), the responsibilities of the Environmental Analyst of the Environmental Operations Group are:

- Responds to emergency incidents and determines the actual or potential environmental impacts
- Directs and assists with the collection of samples in an area with a contaminated release, collects samples after cleanup to verify that cleanup is complete and determines whether remediation work is necessary
- Prepares an Environmental Protection Department Environmental Incident Report
- Determines whether the release needs to be reported to regulatory agencies
- Notifies LLNL management and/or the appropriate regulatory agencies of the incident as directed by the Operations and Regulatory Affairs Division Leader.

#### 4.4 LLNL Fire Safety Division—Emergency Operations Group

The LLNL Fire Safety Division (Fire Department) is called for Level 2, 3, and 4 incidents. The Fire Safety Division is composed of an Administrative Group and an Emergency Operations Group. The Emergency Operations Group acts as the first responder to Level 2, 3, and 4 incidents and is responsible for invoking the incident-command organization.

The first fire officer to arrive at the scene assumes the Incident Commander role until relieved by a Chief Officer. The Incident Commander's specific responsibilities during a Level 2, 3, or 4 incident are as follows:

- Acts as Incident Commander as described in Section 4.1 for Level 2, 3, and 4 incidents (and as described in the *Draft Emergency Plan*)
- Activates the LLNL Emergency Paging System to notify personnel in selected areas of LLNL or the entire LLNL population, if necessary. Initiates evacuation of personnel, if appropriate
- Notifies appropriate State or local agencies with designated response roles if their help is needed (enlists support from agencies that

participate in the Mutual Aid Agreement. If necessary, ensures that the State Office of Emergency Services has been notified)

- Prevents the occurrence, recurrence, and spread of fire, explosion, and waste release by stopping all waste handling processes and operations in the area
- Directs the collection and containment of released waste and the removal or isolation of incompatible waste containers
- Directs monitoring activities for leaks, pressure buildups, gas generation, or ruptures in valves, pipes, or other equipment, whenever this is appropriate
- Ensures that all recovered wastes or material, contaminated soil, or surface water is treated, stored, or disposed of in accordance with all applicable regulations (may delegate this responsibility to the Area 514 Facility Supervisor)
- Ensures personnel are properly decontaminated before being released from an incident.
- Ensures that all emergency equipment used to mitigate the incident is cleaned and fit for its intended use before operations are resumed (may delegate the cleanup of Hazardous Waste Management Division emergency equipment to the Area 514 Facility Supervisor)
- Ensures that all required notifications to outside agencies take place.

The LLNL Emergency Response Organization is discussed in detail in the *LLNL Draft Emergency Plan*.

## **5. ARRANGEMENTS WITH LOCAL AUTHORITIES**

LLNL has agreements with many off-site local authorities including fire departments, medical facilities, and law enforcement agencies. These authorities will provide assistance in the event of emergencies that cannot be handled by LLNL internal emergency response organizations. These include Mutual Aid Agreements, Emergency Medical Services agreements, Law Enforcement Assistance Agreements, and Memoranda of Understanding.

### **5.1 Fire Protection**

The LLNL Fire Department participates with local off-site fire departments in the Twin Valley Mutual Aid agreement. A list of the primary local fire department participants is presented in Table 5-1. The Twin Valley agencies comprise the East Zone of Alameda County; the remainder of the county is divided into the north and south zones. The LLNL Fire Department is the coordinating department for mutual aid in the Twin Valley as well as Alameda County as a whole. The LLNL Fire Dispatcher, backed up

**Table 5-1. Participants in the Twin Valley Mutual Aid Agreement**

California Department of Forestry Castle Rock and Sunol Stations Contact Morgan Hill Fire Dispatch 15670 Monterey Street Morgan Hill, CA 95037 (408) 779-2121	City of Livermore Fire Department 4550 East Avenue Livermore, CA 94550 (510) 373-5450
City of Pleasanton Fire Department 4444 Railroad Avenue Pleasanton, CA 94566 (510) 484-8114	Alameda County Fire Department 835 East 14th Street San Leandro, CA 94577 (510) 618-3490
Dougherty Regional Fire Authority 9399 Fircrest Lane San Ramon, CA 94583 (510) 829-2333	San Ramon Valley Fire Protection District 1500 Bollinger Canyon Road San Ramon, CA 94583 (510) 838-6640
Camp Parks Fire Department 636 Fifth Street Dublin, CA 94568 (510) 803-5612	Veterans Administration Fire Department 4951 Arroyo Road Livermore, CA 94550 (510) 447-2560, Extension 36188

by Alameda County Fire Dispatcher, is responsible for dispatching the various fire units and ascertaining that all jurisdictions have some fire protection, as allocated through pre-determined response assignments. In the event that a fire cannot be mitigated with the facilities of any one of the Twin Valley agreement participants, the other contracting participants shall upon request furnish aid (personnel and equipment) protect life and property from fire.

Each party reserves the right to determine the extent of assistance it will furnish, including the right to refuse to provide assistance when the agencies' own fire protection needs are such that equipment or personnel may not be safely released for service elsewhere. The Fire Chief of the City of Livermore is designated as administrator of the agreement. The agreement will remain in full force and effect without renewing, except that any party may withdraw by giving 30 days written notice.

LLNL is also signatory to automatic aid agreements with the City of Livermore Fire Department and the Alameda County Fire Department, which provide automatic response on a first alarm basis

Copies of all agreements with off-site fire agencies are maintained by LLNL's Fire Department.

## **5.2 Emergency Medical Service**

The LLNL Fire Department is also an emergency medical service (EMS) first responder. The LLNL Health Services Department has hospital facilities and a decontamination unit at Building 663. An individual contaminated with hazardous substances may be brought to the facility to undergo decontamination and emergency medical treatment.

Emergency response personnel are regulated by State and County EMS policies and procedures. LLNL is signatory to the Alameda County EMS system for Central and East County. The EMS is a dynamic mix of private and public health care providers working together to improve the quality of patient care in the pre-hospital and hospital settings. Pre-hospital care providers include:

- Dispatchers
- Police personnel
- Fire personnel
- Ambulance personnel
- Mobile intensive care nurses
- Base hospital physicians.

Participants in the Alameda County EMS for Central and East County are presented in Table 5-2.

#### 5.2.1 Alameda County Medical Alert Plan

LLNL works closely with medical personnel in Alameda County via its countywide Emergency Medical Services (EMS) plan. Alameda County has three zones, each with a base hospital. LLNL is located in Central and East County. ValleyCare Medical Center is the receiving base hospital. The plan is activated when medical service needs, resulting from an incident, will overwhelm the resources of a single EMS zone. In case of a multi-casualty incident, ALCO-CMED (Alameda County Medical Alert Plan-County Medical Emergency Dispatch/San Leandro) alerts all hospitals in the plan, the base hospital in the affected EMS zone being the coordinating body. Radio links ALCO-CMED with LLNL's Fire Safety Division and Health Services. ALCO will send ambulances to the disaster site, maintain the emergency rooms (ERs), and direct ambulances to hospital ERs. Air transportation via helicopter may be used if the overall time for transport to a hospital is reduced by at least 20 minutes over that of ground transportation. Other hospitals cancel routine services to prepare to receive patients.

The EMS District is a division of the Alameda County Health Care Services Agency, Public Health Services Department. The EMS District coordinates EMS activities in Alameda County. The Board of Supervisors (five members) makes general policy decisions affecting the EMS District. The County Health Officer is designated the EMS Medical Director by the Board of Supervisors. The County Health Officer delegates this responsibility to the EMS District Medical Director. Medical control of the pre-hospital medical care within the system is the responsibility of the EMS Medical Director. Copies of EMS agreements are maintained by the LLNL Fire Department.

**Table 5-2. Receiving Hospitals in the Alameda County Emergency Medical Service\***

Hospital	Capabilities
Alameda Hospital 2070 Clinton Avenue Alameda, CA 94501 522-3700	OB-Gyn Basic EMT/FRD Base
Alta Bates Hospital 3001 Colby Street Berkeley, CA 94705 540-0337	Basic OB-Gyn IC Nursery Burn Unit EMT/FRD Base 5150 Designation
Children's Hospital 747 – 52nd Street Oakland, CA 94609 428-3000	Pediatric Cases only Trauma Center, IC Nursery Cardiovascular Surgery Pediatric ICU
Eden Hospital 20103 Lake Chabot Road Castro Valley, CA 94546 537-1234	Basic Trauma Center 5150 Designation OB-Gyn EMT/FRD Base EMS LS (Landing) Helipad
Highland General Hospital 1411 E. 31st Street Oakland, CA 94602 437-4557	Trauma Center OB-Gyn 5150 Designation Basic ICN ALS Base
Kaiser Oakland Hospital 280 W. MacArthur Blvd. Oakland, CA 94611 596-1000	OB-Gyn IC Nursery Pediatric ICU NICU (Neonatal) Basic
Kaiser Hayward Hospital 27400 Hesperian Blvd. Hayward, CA 94545 784-5000	OB-Gyn Basic Pediatric ICU ALS Base
John Muir Medical Center 1601 Ygnacio Valley Road Walnut Creek, CA 94598 930-3000	Trauma Center Helipad Basic ALS Base
Oakland Naval Hospital 8750 Mountain Blvd. Oakland, CA 94627 633-5000	OB-Gyn Stand-by

**Table 5-2. (Continued)**

<b>Hospital</b>	<b>Capabilities</b>
San Leandro Hospital 13855 East 14th Street San Leandro, CA 94578 (510) 357-6500	Basic
San Ramon Regional Medical Center 6001 Norris Canyon Road San Ramon, CA 94583 275-9200	Basic Ob-Gyn
St. Rose Hospital 27200 Calaroga Avenue Hayward, CA 94545 782-6200	Helipad EMT/FRD Base Basic Ob-Gyn
Summit Hospital Hawthorne and Webster Sts. Oakland, CA 94609 655-4000	Basic OB-Gyn Cardiovascular Surgery Orthopedic
ValleyCare Medical Center 5555 West Las Positas Boulevard Pleasanton, CA 94588 734-3350	Basic OB/Gyn 5150 Designation ALS Base EMT/FRD Base EMS LS
Washington Hospital 2000 Mowry Avenue Fremont, CA 94538 797-1111	Basic Cardiovascular Surgery OB-Gyn 5150 Designation Helipad

\*The Alameda County Emergency Medical Service district office address is:

The Alameda County Health Care Services Agency  
Emergency Medical Service District  
55 Santa Clara Avenue, Suite 200  
Oakland, CA 94610  
268-7355 (not open Tuesday mornings)

LLNL is also signatory to a Memorandum of Agreement with ValleyCare Medical Center in Pleasanton and Eden Hospital (trauma center) in Castro Valley for treatment of radiologically contaminated personnel. Air transport of patients is provided by Alameda County under the Alameda County Medical Alert Plan. The decision for air transport is normally made by LLNL Health Services Department personnel, but may be made by the LLNL Fire Department, if warranted. Notification is coordinated by the LLNL dispatcher.

### 5.3 Law Enforcement

The LLNL Safeguards and Security Department has established agreements for nonreciprocal police assistance to LLNL through the Law Enforcement Mutual Aid Agreement in Region 2. Agencies participating in this region are listed in Table 5-3.

The Alameda County Sheriff serves as coordinator and has authority to implement this agreement whenever assistance is requested of the Region 2 participants.

LLNL will seek assistance from the Law Enforcement Mutual Aid participants of Region 2 for traffic and crowd control, whenever large-scale evacuations or public demonstrations take place. Requests for assistance from outside law agencies will be made by the LLNL Safeguards and Security Department, as appropriate.

The LLNL Safeguards and Security Department is also signatory to a Law Enforcement Assistance Agreement (LEAA) with the City of Livermore for traffic control east of (and on) Vasco Road during smaller laboratory evacuations and public demonstrations. For such disturbances along Greenville Road and East Avenue (from Greenville to Vasco Road), LLNL has a Memorandum of Understanding (MOU) with the California Highway Patrol. The Protective Planning and Assurance Office of the LLNL Safeguards and Security Department maintains all agreements with off-site law enforcement agencies.

### 5.4 Miscellaneous Agreements

LLNL also participates in numerous other mutual aid agreements. These include: the State of California Office of Emergency Services, City of Livermore (Automatic Aid Agreement), City of Tracy, University of California and State of California (Master Mutual Aid Agreement).

**Table 5-3. Law Enforcement Mutual Aid Agreement in Region 2**

Alameda County Courthouse 1225 Fallon St., Room 103 Oakland, CA 94612-4381	California Highway Patrol Golden Gate Division 1551 Benicia Road Vallejo, CA 94591
City of Livermore Police Department 1110 South Livermore Avenue Livermore, CA 94550	San Joaquin County Sheriff Department 7000 S. Michael Canlis Blvd. French Camp, CA 95231
Sandia National Laboratories, Livermore Physical Security Organization 8531, Building 912, Room 091 East Avenue Livermore, CA 94550	Federal Bureau of Investigation San Francisco Office 450 Golden Gate Avenue P.O. Box 36015 San Francisco, CA 94102

## **5.5 Distribution of Contingency Plans and Emergency Response Information**

Contingency plans from each of the Hazardous Waste Management Facilities are sent to LLNL's Fire Department, Health Services Department, and Safeguards and Security Department. These departments coordinate all emergency response activities with off-site emergency responders and, therefore, will transmit all pertinent information to affiliated off-site agencies, as warranted by the emergency situation.

Pertinent off-site agencies are sent copies of Hazardous Waste Management Facility contingency plans. These agencies include: ValleyCare Medical Center, all participants in the Twin Valley Mutual Aid Agreement, the Alameda County EMS District Office, the Alameda County Sheriff's Office, and the City of Livermore Police Department.

The LLNL Fire Department is familiar with the layout of all Hazardous Waste Management Facilities and, therefore, with the locations where Hazardous Waste Management Facility Operations personnel will be working. Both the LLNL Fire Department and the LLNL Health Services Department are familiar with the types of injuries or illnesses which could result from fires, explosions, or releases from the Hazardous Waste Management Facilities.

The LLNL Fire Department and the Safeguards and Security Department are familiar with all entrances to the Hazardous Waste Management Facilities and the LLNL site and with all possible evacuation routes.

Evacuation routes from the Hazardous Waste Management Facilities are presented in Section 8 of each facility contingency plan. Evacuation from the overall LLNL site is presented in Appendix VIII-E of the Part B Permit Application and in LLNL's *Draft Emergency Plan*.

## **6. EMERGENCY CONTROL PROCEDURES**

Response to an emergency at the Area 514 Facility is designed to be at a level appropriate to the incident. The transition from one level of emergency to another must be automatic and keyed to well-defined criteria. Emergency action levels are defined based on the event and the potential hazard to on-site personnel and off-site persons. The LLNL and DOE emergency classification schemes are defined in Section 1.2. Hazardous Waste Management Division may respond to a Level 1 incident; the Fire Department will respond to Level 2, 3, or 4 incidents. To determine if a Level 1 incident has been exceeded, refer to the criteria in Section 1.3.

### **6.1 LLNL Site-Wide Emergencies**

LLNL maintains a Self-Help Program. Each department/division is required to prepare and keep its own self-help plan, designed to collect and safeguard personnel and visitors during site-wide emergencies. Whenever a major emergency event

occurs and LLNL's Emergency Response Organization is fully committed, the self-help plans are enacted.

LLNL is divided into multiple Self-Help Zones, each under the direction of a senior manager (Zone Supervisor). Within each zone are designated Assembly Points, where Assembly Point Leaders control the local emergencies while awaiting assistance from the Emergency Response Organization. The highest ranking individual at the Assembly Point is appointed leader. Personnel are instructed to meet at this Assembly Point whenever evacuations are necessary. The Area 514 Facility is located in Self-Help Zone 13. See Section 8 for more specific emergency evacuation instructions.

## **6.2 Emergency Situations**

The following sections describe the procedures for each of several emergency situations.

### **6.2.1 Fire or Explosion**

If a fire or explosion occurs, personnel should:

- Dial ext 911 and give the Emergency Dispatcher the following information:
  - Name
  - Location of the fire (building, room, area, cross streets, or any other information that might help the emergency response personnel quickly locate the scene)
  - Nature of the fire (electrical, chemical, etc.)
  - Additional information that might affect the response personnel (severity of the fire, materials at risk in the immediate area)
- Remain on the phone to verify the information given to the Emergency Dispatcher and receive instructions
- Notify supervisor
- Isolate the emergency area
- Give emergency aid to the injured
- After performing the above steps, if a fire can be controlled with a fire extinguisher, an employee **trained** in using fire extinguishers **may** attempt to control the fire (see Section 7.3.1).

The Incident Commander (from the LLNL Fire Department) is responsible for controlling the incident, as described in Section 4.4.

### 6.2.2 Earthquakes

The following precautions should be taken during an earthquake:

- Remain calm, think through the consequences of any actions taken, and try to calm and reassure other individuals
- Indoors, watch for falling light fixtures and other objects; if in danger, get under a table or desk in a corner away from the windows, or stand in a strong doorway; encourage others to follow your example; usually it is best not to run outside
- Do not use the telephone unless you have an emergency; the telephone system, even after a minor earthquake, becomes overloaded with calls making it difficult for people with emergencies to place calls; wait at least 1/2 hour before calling home or making any other non-emergency calls
- If you must leave the building, choose your exit as carefully as possible
- Do not touch downed power lines or objects that are touching downed lines
- Outside, avoid high buildings, walls, power poles, and other objects that could fall; do not run through streets; if possible, move to an open area away from all hazards
- Follow instructions that may be given over the emergency public address system; if you are told to evacuate the building, go to the designated Assembly Point for your area unless directed otherwise (see Section 8).

After a major earthquake, determine if fellow workers are injured. If instructed to evacuate, go to the Emergency Assembly Point, if conditions are safe in that area. Then follow the instructions of the Assembly Point Leader. He or she will organize a sweep team to accomplish the tasks listed below. If evacuation is not ordered, then find a safe place and stay there until the emergency subsides. Then, if necessary, assist the Area 514 Facility Supervisor or alternate and/or the Facility Coordinator in accomplishing the following tasks:

- Do not move seriously injured persons unless they are in immediate danger of further injury
- Call the Emergency Dispatcher (ext 911) for emergency assistance

- Check for fires or fire hazards, particularly in hazardous, radioactive, and mixed waste storage areas
- Check utility lines and equipment for damage; shut off electrical power to equipment; do not use matches, lighters, or open-flame appliances or operate electrical appliances or switches until you are sure no flammable vapors are present
- Inspect the facility to verify that there has been no damage to tanks, piping systems, containers, or storage areas; the area should be cordoned off to control access
- Stop the source of any releases and provide containment of any released material
- Assist in the cleanup of any released chemicals or other potentially harmful materials as directed in Section 6.2.6
- Report any emergencies to the Emergency Dispatcher.

### 6.2.3 Power Outages

Routine waste management operations of this facility are conducted during daylight hours (8:00 a.m. to 5:00 p.m.), Monday through Friday, except on holidays.

Many of the Area 514 Facility container storage areas (e.g., 514-1, 514-2, 514-3, 514-4) are in the open without lighting systems. Power outage at those storage units would have little or no effect on operations.

A gas-powered portable generator and three floodlights are maintained in the Hazardous Waste Management Division's release response trailer which is located in the Area 612 Facility. This equipment is available for use during nonroutine waste management operations or emergency situations. The portable generator is serviced and tested once a month regardless of use.

An additional portable generator is maintained with additional floodlights and construction light strings in the Support Services Group equipment yard located north of Building 419. This generator is also tested and serviced once a month regardless of use. The generators, floodlights, and construction string lights are available as needed.

Employees also have access to flashlights to monitor the facility during a power outage. In the event that a power outage occurs at the same time as an indoor waste release, a portable generator with accompanying floodlights is available for cleanup operations. On-line backup power sources are not available for the Area 514 Facility. In the case of a power outage, all processes would stop until power was restored. This lack of backup power does not pose a threat, since none of the operations at the Area 514 Facility require power to prevent a release of hazardous substances. All waste transfer valves at the

Area 514 Waste Water Treatment Tank Farm Unit or Area 514 Storage and Treatment Quadruple Tank Unit are pneumatic. During a power outage, the valves shut and all waste transfer ceases. The Area 514 Waste Water Filtration Unit, Building 513 Silver Recovery Unit, Building 513 Shredding Unit, Building 513 Solidification Unit, Area 514-1 Cold Vapor Evaporation Unit (proposed), Area 514-1 Portable Blending Unit (proposed), Area 514-1 Tank Blending Unit (proposed), Area 514-1 Centrifugation Unit (proposed), and Area 514-1 Carbon Adsorption Unit (proposed) would all be manually shut down in the event of a power failure. This prevents the units from restarting, while unsupervised, when power is restored.

Upon loss of power, employees should:

- Cease all work in the affected waste handling and processing areas
- Secure all tools, equipment, and systems in accordance with OSPs, and leave them in an appropriate state for restoration of regular power (manually shut down the Area 514 Waste Water Filtration Unit, Building 513 Silver Recovery Unit, Building 513 Shredding Unit, and Building 513 Solidification Unit)
- Leave the affected area, observing proper exit procedures (e.g., proper removal of protective clothing and protective equipment)
- Report to supervisor for instructions.

#### 6.2.4 Container Failure

If a container or tank holding hazardous, toxic, radioactive, or mixed waste or material releases, leaks, or otherwise releases its contents to the environment and the release meets criteria for a small release and there is no immediate threat to personnel safety, Hazardous Waste Management Division personnel take immediate action to contain the release. Follow release response procedures outlined in this section as well as Section 6.2.6.

Treatment tanks are inspected on a daily basis to facilitate early detection of structural problems. Personnel are instructed to immediately halt waste addition to a defective tank. The contents of the defective tank must be transferred to an empty treatment tank (there is a Hazardous Waste Management Division policy of always keeping one of the six treatment tanks empty, in case of emergency). The contents may also be transferred to the Area 514 Storage and Treatment Quadruple Tank Unit (proposed). A defective tank remains out of service until repairs are made and then certified by a state registered engineer.

##### 6.2.4.1 Procedures to Stop and Contain Waste

When visual monitoring indicates that a leak or release has occurred, a series of steps must be taken to evaluate the situation. These steps are structured to provide the appropriate actions to (1) minimize the environmental impact and (2) determine a course of action to remedy the problem.

The following actions are required when container failure is detected:

- Cease waste handling operations
- Isolate or remove any containers of incompatible wastes from release vicinity if contact is possible
- Initiate release response in accordance with Section 6.2.6
- Use Drum Repair Kit for temporary drum repair, in accordance with Section 6.2.6.1 (Step 2)
- Place the damaged container into a compatible overpack drum or other suitable container when conditions are safe.

The following actions are required when treatment tank failure is detected:

- Immediately stop adding waste to the tank
- Immediately transfer contents of the defective tank to a reserve tank
- Immediately initiate release response in accordance with Section 6.2.6
- Keep defective tank “out-of-service” until repairs are made and then certified by a State registered engineer
- Determine whether environmental remediation work is required. If so, clean up and properly dispose of all contaminated environmental media (contact Environmental Analyst for an assessment).

#### 6.2.4.2 Removal of Waste

Liquid within secondary containment is removed in a timely manner. Large releases are pumped into appropriate containers and small releases are treated with absorbent material that is placed into appropriate containers. All liquids contained in the basins, including rain and rinse water, are collected, then sampled and analyzed. These accumulated liquids are only discharged to the sanitary sewer if the analytical results show contaminant concentrations below established discharge limits and a signed sewer release authorization is issued. If the liquids do not meet discharge criteria, they are either treated at the Area 514 Facility or shipped off-site to a permitted treatment, storage, and disposal facility.

#### 6.2.5 Equipment Failure

Procedures have been developed to manage situations in which equipment failure may cause a release of hazardous, radioactive, or mixed waste or materials. These pertain to forklifts and cranes that handle containerized loads and treatment wastes. If Area 514 Facility treatment units fail, the equipment is immediately shut off, and operations

are not resumed until repairs are made. Treatment tank failure is managed as discussed in Section 6.2.4.

#### 6.2.5.1 Actions Required to Stop and Contain Waste

When visual monitoring indicates that a leak or release has occurred, a series of steps must be taken to evaluate the situation. These steps are structured to provide appropriate actions to (1) minimize the environmental, safety, and health impact and (2) determine a course of action to remedy the problem. The following actions are required after a leak caused by equipment failure is detected:

- Cease operation of the equipment
- Isolate or remove any containers of incompatible wastes from release vicinity if contact is possible
- Initiate release response in accordance with Section 6.2.6
- Remove the waste from the system and/or secondary containment as described in Section 6.2.4.2
- Locate the leak
- Decontaminate the equipment
- Repair or scrap equipment (initiate closure proceedings for scrapped permitted equipment).

#### 6.2.5.2 Repairs

Equipment may be returned to service after the waste is removed and repairs are completed.

#### 6.2.6 Release Response for Hazardous Materials and Waste

Releases from Level 1 incidents are called “small incidents.” These releases may be cleaned up by Hazardous Waste Management Division personnel without notifying the LLNL Fire Department. Response procedures for Level 1 incidents are included in this document to provide guidance for Hazardous Waste Management Division personnel. This contingency plan is not considered to be implemented for Level 1 incident mitigation. Releases from Level 2, 3, and 4 incidents are called “large incidents” and must be mitigated by the LLNL Fire Department. To determine if a release is considered a small incident, the following criteria must be met:

1. The identity of the released material or waste is known

2. The released material or waste is commonly handled by Hazardous Waste Management Division, and the personnel are familiar with its hazards
3. The release can be contained, controlled, or cleaned up, by two people in less than one hour.

The Area 514 Facility Supervisor or alternate will make this determination. He or she may consult with the Hazards Control ES&H Team for help with this assessment. In case of a radioactive or mixed waste release the Hazardous Control ES&H Team is called to monitor the radioactivity levels. If personnel have any doubt about their ability to clean up a release properly and safely, the LLNL Fire Department should be notified immediately.

#### 6.2.6.1 Ten-Step Release-Response Guidance Plan

The ten-step approach is followed to manage leaks and releases of hazardous, toxic, radioactive, or mixed materials and wastes. This approach is illustrated below.

#### Ten-Step Approach to Managing Leaks and Releases of Hazardous Materials and Wastes



Identify the spill



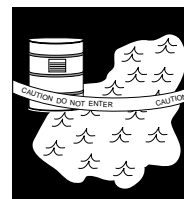
If safe, shut off the source



Eliminate ignition sources

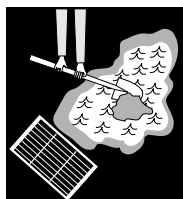


Contact your supervisor

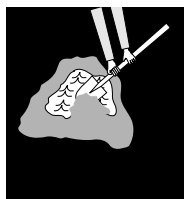


Cordon off the area

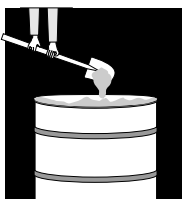
If the release is manageable, continue with steps 6–10. If not, call the LLNL Fire Department on ext 911; if any of the above steps are not considered safe, then immediately call the Fire Department.



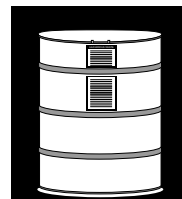
Contain



Absorb and neutralize



Clean up



Dispose of as hazardous waste



Decontaminate and restock spill equipment

**Note:** Depending on the type of release, proper decontamination procedures and equipment requirements need to be established. A decontamination zone will help ensure that wastes from this activity is

properly collected. If direct contact with a hazardous or toxic waste or chemical arises from any release-response actions, personnel should do the following:

- Use eyewash or shower
- Remove contaminated clothing
- Use soap and water to scrub off contaminant

More detailed descriptions of each step are as follows:

1. Identify the release

- Stand up-wind of the released substance
- Identify wastes by information on the container labels: hazardous waste by the red/white label; radioactive waste by the yellow/white label; and mixed waste by the red/yellow label
- Identify wastes also by information on the Waste Disposal Requisition form
- Do not remain in the area if an immediate personnel hazard exists
- If the label cannot be read and the material cannot be positively identified, call the LLNL Fire Department on ext 911 for assistance. Cordon off the area affected by the release until the Fire Department arrives.

2. Shut off the source of release

- If waste type is known and no major hazards exist, do the following:
  - Wear PPE sufficient to protect against the material or waste released (see Appendix A for guidelines or contact Hazards Control ES&H Team).
  - Shut off the source of the release immediately or place the container in an upright position. Each Emergency Spill Kit contains a Drum Repair Kit; use the repair kit to temporarily plug holes or small tears in the container until the waste can be overpacked into a larger container. Prompt action can prevent a small release from becoming a large one.

3. Eliminate ignition sources

- Wiring and breakers
- Exhaust systems
- Generators and pumps.

All sources of spark or flame in the area should be extinguished. In addition, all containers of waste incompatible with released materials should be moved away from the release vicinity if contact is possible.

4. Contact your supervisor. Report the release to the supervisor as soon as possible. Depending on the magnitude of the release, the following people should be notified.

- Supervisor
  - All releases
- Health and Safety Technician
  - All releases
- Environmental Analyst
  - All releases
- LLNL Fire Department
  - Any release that cannot be safely cleaned up by Hazardous Waste Management Division.

5. Cordon off the area (this step provides instructions for the Area 514 Facility Supervisor or alternate)

- If the release is manageable, evacuate all persons from the area that are not involved in cleanup operations. Make sure no unauthorized personnel enter the release area. At this point call the Hazards Control ES&H Team if advice is needed regarding the type of PPE or containment equipment to use
- Have the release area cordoned off (put up a barricade with tape or rope)
- If the release is too large for Hazardous Waste Management Division personnel to manage, call the LLNL Fire Department (ext 911). Evacuate all persons from the release area. Prevent all entry to the release area until the LLNL Fire Department arrives.

## 6. Contain the release

- Wear personal protective equipment adequate to protect against exposure or contact with the material or waste released. Protective clothing can be found in the nearest Emergency Spill Kit. Additional personal protective equipment can be found in the nearest PPE locker. See Figures 7-1 through 7-5 located in Section 7 for Spill Kit and PPE locker locations. Appendix A provides general guidelines for choosing PPE. For further assistance, contact the Hazards Control ES&H Team
- Use the appropriate equipment from the nearest Emergency Spill Kit to contain and absorb the material or waste released (see Appendix B). Contact the Hazards Control ES&H Team for additional assistance.

### Containment Techniques for all Liquid Waste Releases

- Choose an absorbent material that is compatible with the material or waste released.
- If the release can safely be cleaned up by Hazardous Waste Management Division personnel, efforts should be made to keep the release from spreading. Containment is possible by damming, diking, or blocking the path of the release. Absorbent material can be spread immediately around the release area
- Use absorbent socks (“Pigs”) or loose absorbent to dam up waste, beginning at its point of most rapid flow and on sides where release flows toward drains or other conduits to the environment.

### Techniques to Protect Drains

- Use absorbent socks, or loose absorbent material to encircle the entire drain to prevent the waste from entering
- Add a second outside ring if absorbent material appears saturated
- Protect floor drains, storm drains, and any other conduits to the environment, by surrounding them with an absorbent dike.

## 7. Absorb and/or neutralize

- Cover the contained release with loose, compatible absorbent material, working from the perimeter inward toward the center

- If neutralization of corrosive releases is desired, then an appropriate neutralizing absorbent may be substituted
- Small releases may be absorbed solely with an absorbent sock. See Appendix C for more details regarding procedures for absorbing and/or neutralizing releases of acid, aqueous, caustic, flammable liquid, or oxidizer materials or wastes.

#### 8. Clean up the area

- Use appropriate waste disposal containers.
- Once the release has been contained and absorbed, properly clean up the spent absorbent and cleanup materials. Used absorbent, clothing, and cleanup supplies that cannot be properly decontaminated must be disposed of as hazardous, radioactive or mixed waste, as applicable. Drums or other appropriate containers may be used to contain spent absorbent. Appropriate waste labels must be used to identify waste containers. Release response supplies that have been used in the release response must be replaced before Area 514 Facility operations resume.
- Swipe samples of the release area are taken and analyzed to verify the adequacy of cleaning effort, based on regulatory thresholds for hazardous waste classification.

#### 9. Dispose of hazardous waste

- Use existing Hazardous Waste Management Division procedures
- Evaluate all materials used in the release response to determine whether they must be managed as hazardous, radioactive, or mixed waste. All regulated waste must be handled according to Hazardous Waste Management Division procedures.
- Complete the appropriate waste label and attach to the container.
- Initiate the Waste Disposal Requisition process.

#### 10. Decontaminate and restock

- Establish a decontamination zone for personnel, if warranted
- Remember: Handle rinse water from decontamination operations as a hazardous, radioactive, or mixed waste, pending analysis results. For disposition procedure, see 6.3.1.

- Before resuming operations, restock supplies and decontaminate equipment and PPE, if they are intended for future use. If disposable, discard in accordance with all applicable regulations.

## **6.3 Decontamination**

### **6.3.1 Hazardous Waste Management Division Decontamination and Restocking Activities for a Small (Level 1) Incident**

All equipment, protective clothing and other materials used in release response are evaluated to determine whether they are contaminated with hazardous, radioactive, or mixed wastes. All nondisposable items are decontaminated. Rinse water from decontamination operations is managed as hazardous waste pending analysis. If test results indicate rinse water is hazardous, toxic, radioactive or mixed, then it is managed according to the relevant regulatory requirements. These accumulated liquids are only discharged to the sanitary sewer if the analytical results show contaminant concentrations below established discharge limits and a signed sewer release authorization is issued. If the liquids do not meet discharge criteria, they are either treated at the Area 514 Facility or shipped off-site to a permitted treatment, storage, and disposal facility. All disposable items are handled as hazardous, toxic, radioactive, or mixed waste unless test results indicate that the waste is not subject to regulatory requirements. Swipe samples are taken of the affected area and equipment. Analytical results from swipes and rinse water are used to verify whether decontamination procedures are complete, based on regulatory thresholds for hazardous waste classification.

All hazardous, radioactive, and mixed wastes are properly packaged and labeled. A waste disposal requisition form is completed and processed for each container. Spill Kits and PPE lockers are then restocked.

### **6.3.2 LLNL Fire Department Decontamination Activities for Large (Levels 2, 3, and 4) Incidents**

The LLNL Fire Department manages all decontamination efforts following large incidents. Their decontamination procedures are discussed in the LLNL *Fire Department Policies and Procedures* (Volume 1), under Tactical Plan 1607 (LLNL, 1987).

## **6.4 Internal Notification**

In the event of a large hazardous, radioactive, or mixed waste release (Level 2, 3, or 4 incident), fire, or other emergency, the observing Supervisor or designee immediately notifies the Emergency Dispatcher by dialing ext 911 on the nearest available telephone. If necessary, the Facility Operations Supervisor or alternate will initiate evacuation procedures of facility personnel (see Section 8 for more details). If any questions exist as to the magnitude of the emergency and whether or not it should be called in, the Area 514 Facility Supervisor or alternate should call the Hazards Control ES&H Team to help with the assessment.

If the decision is made to call the LLNL Fire Department, dial ext 911. The caller should remain on the line to verify that the dispatcher has the correct information and receive instructions. Once notified, the Emergency Dispatcher relays the information promptly over dedicated telephone lines to the response groups who need to respond immediately. After this is completed, the Dispatcher uses the best available method for notifying other personnel that are requested. This is normally accomplished using a radio page for key individuals. During off-shift hours, key personnel are notified by telephone or radio page. Response personnel are available on a 24-hour basis.

## **6.5 External Notification**

Off-site agencies are notified according to the emergency classification or the need for support. Information is provided by using standardized formats as much as possible, as described in the LLNL *Draft Emergency Plan*. The Emergency Dispatcher, under the direction of the Incident Commander, makes the initial notifications. The Department of Energy Oakland Operations Office; the City of Livermore; Alameda County; and appropriate State agencies will be notified and kept informed throughout the emergency. Additionally, if an alert involves a security threat, the Federal Bureau of Investigation is notified.

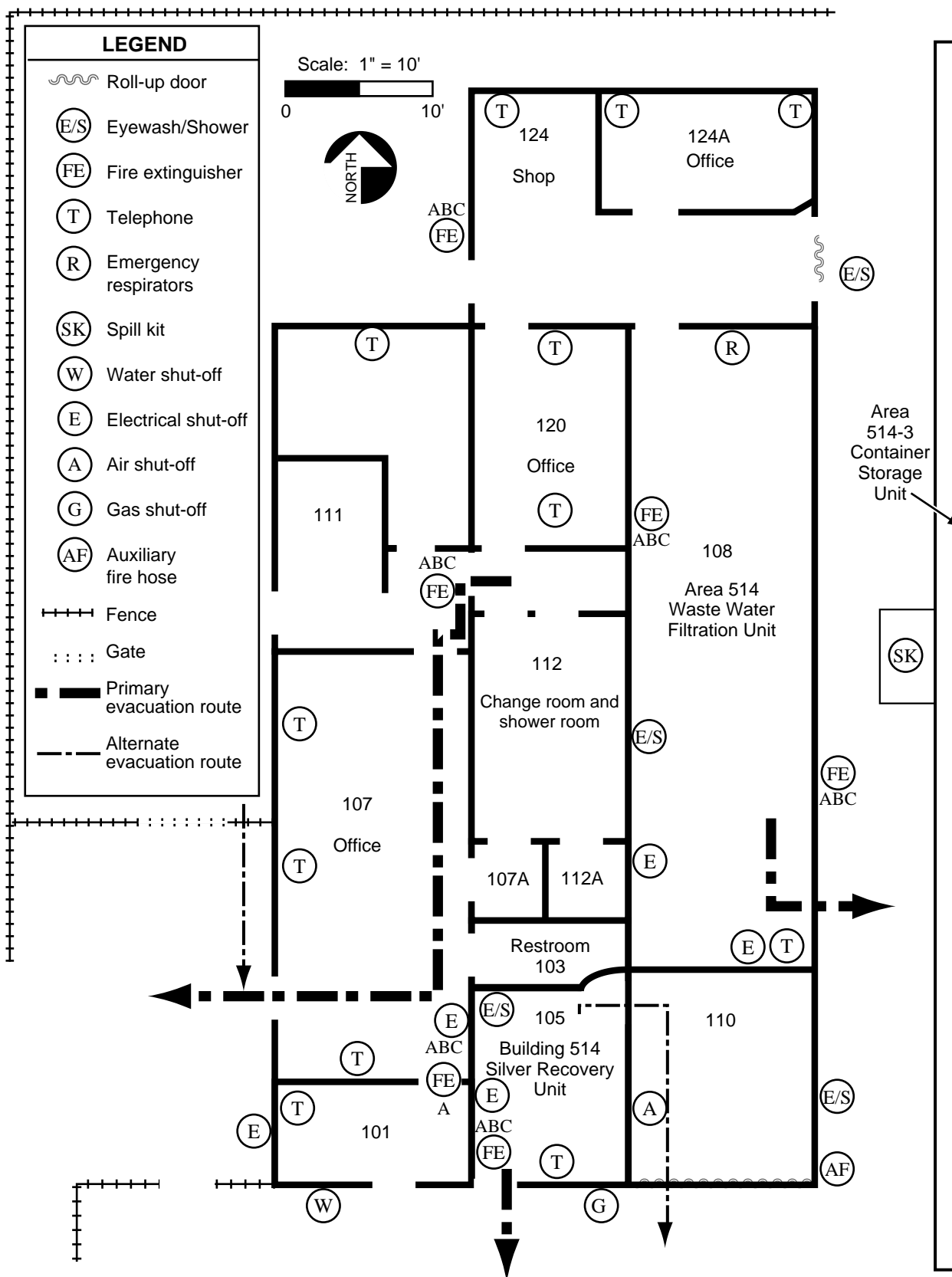
If the Incident Commander or designee determines that the release, release, fire, or explosion could threaten human health or the environment or otherwise cause the implementation of this contingency plan, the Incident Commander reports that finding as discussed in Section 9.2.

## **7. EMERGENCY EQUIPMENT**

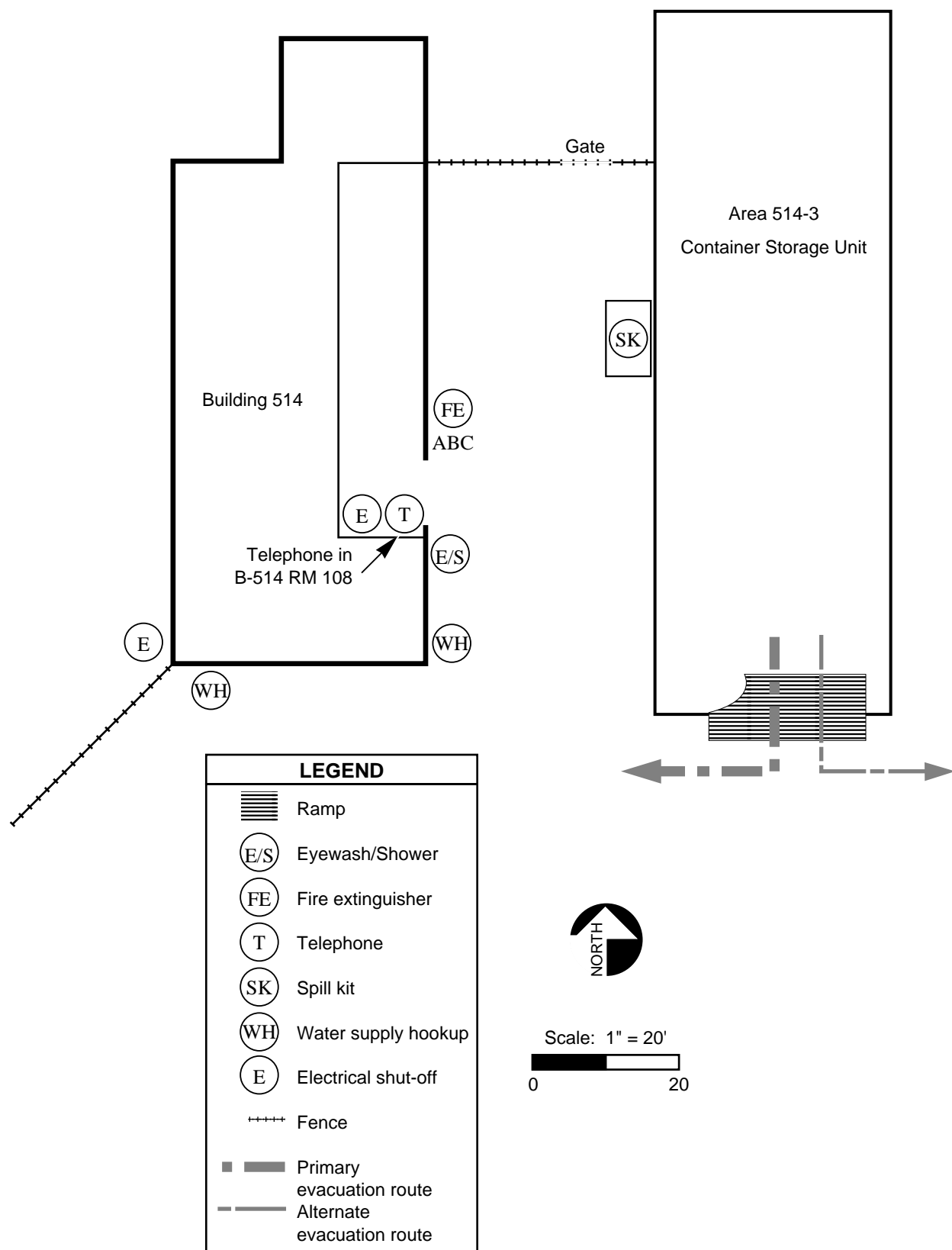
This section briefly describes the emergency equipment located at the Area 514 Facility. This equipment includes the internal and external communication systems, the fire suppression systems, the water supply, the emergency response and release control equipment, MSDSs, the emergency lighting systems, and the decontamination equipment. Pertinent emergency equipment is listed in Appendix D with location(s), a basic physical description, and a brief statement of capabilities for each item.

### **7.1 Internal Communication System**

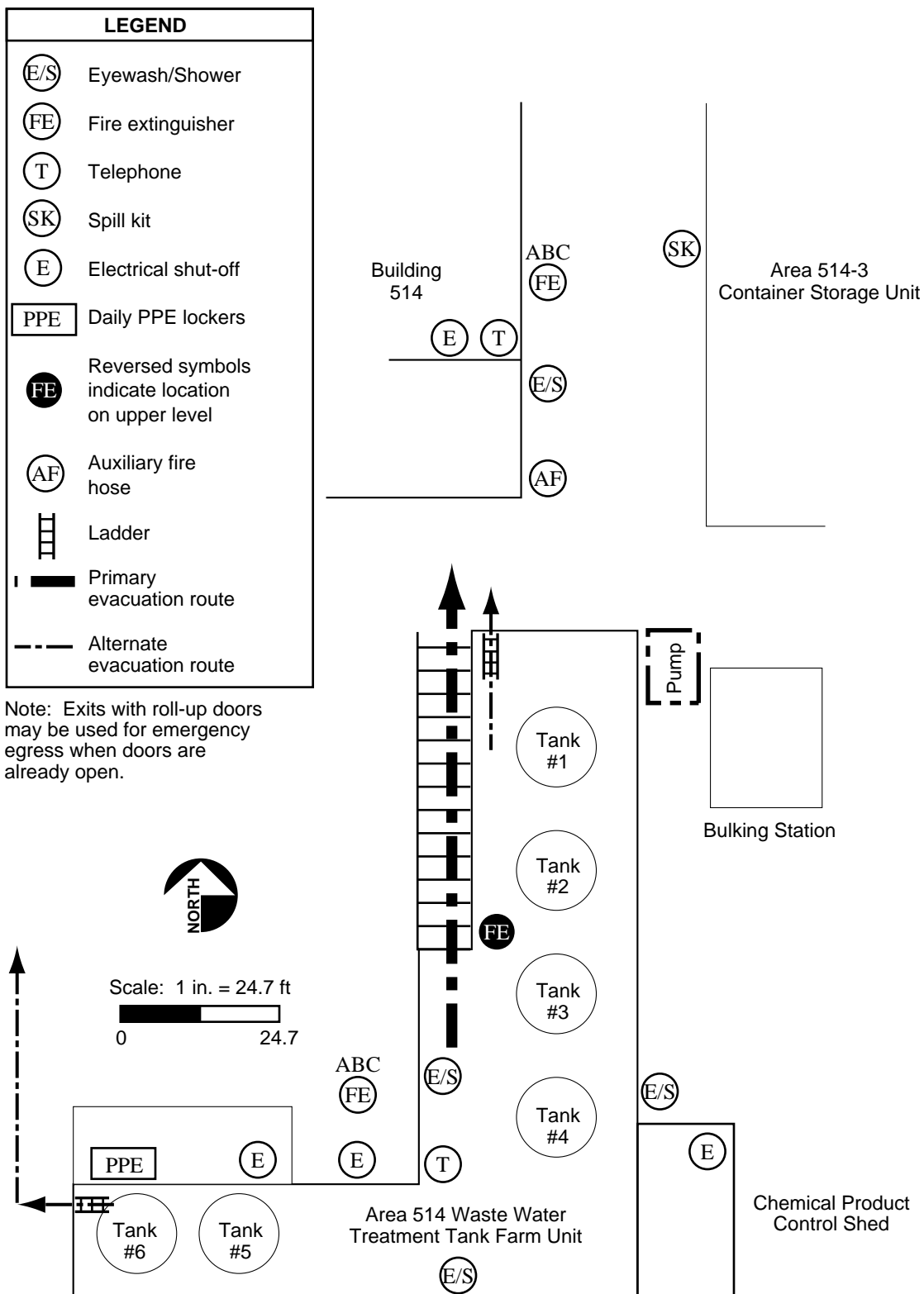
Telephones are located throughout the Area 514 Facility (see Figures 7-1 through 7-5). During emergencies, these telephones can be used to notify the supervisor or alternate, the LLNL Emergency Dispatcher, and other key personnel of the incident. These individuals can help summon additional responders and/or initiate evacuation procedures. In addition, all Hazardous Waste Management Division Operations personnel wear radio pagers. During an emergency, they can all be paged as a group. The “Group 3” code is shown on their pager, in addition to the telephone extension to call for instructions. The Area Supervisor, his or her alternate, the Hazardous Waste Management receptionist, or Hazardous Waste Management can activate this system.



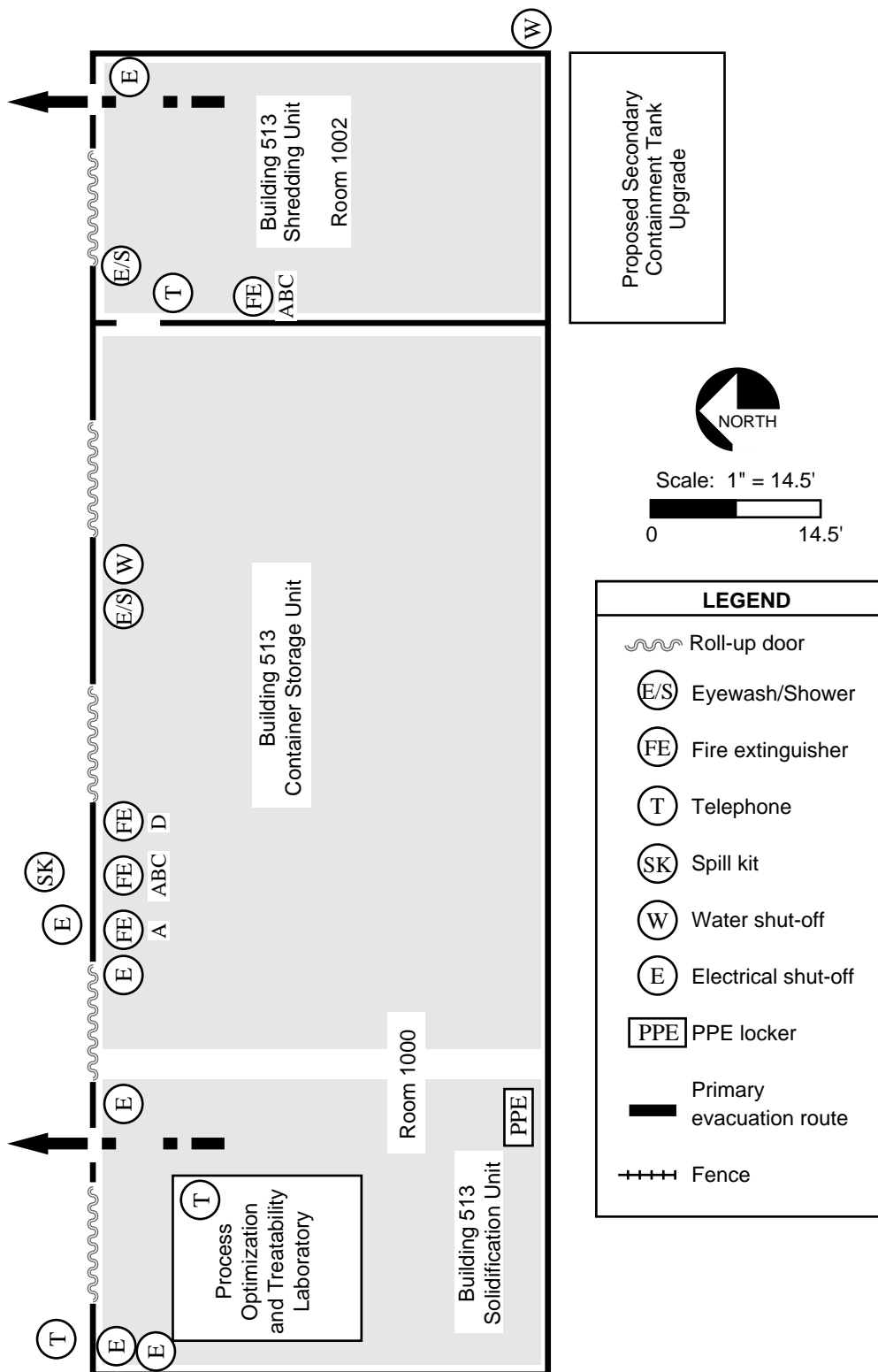
**Figure 7-1. Bldg. 514 Evacuation Routes and Emergency and Safety Equipment and Utility Shut-Off Locations**



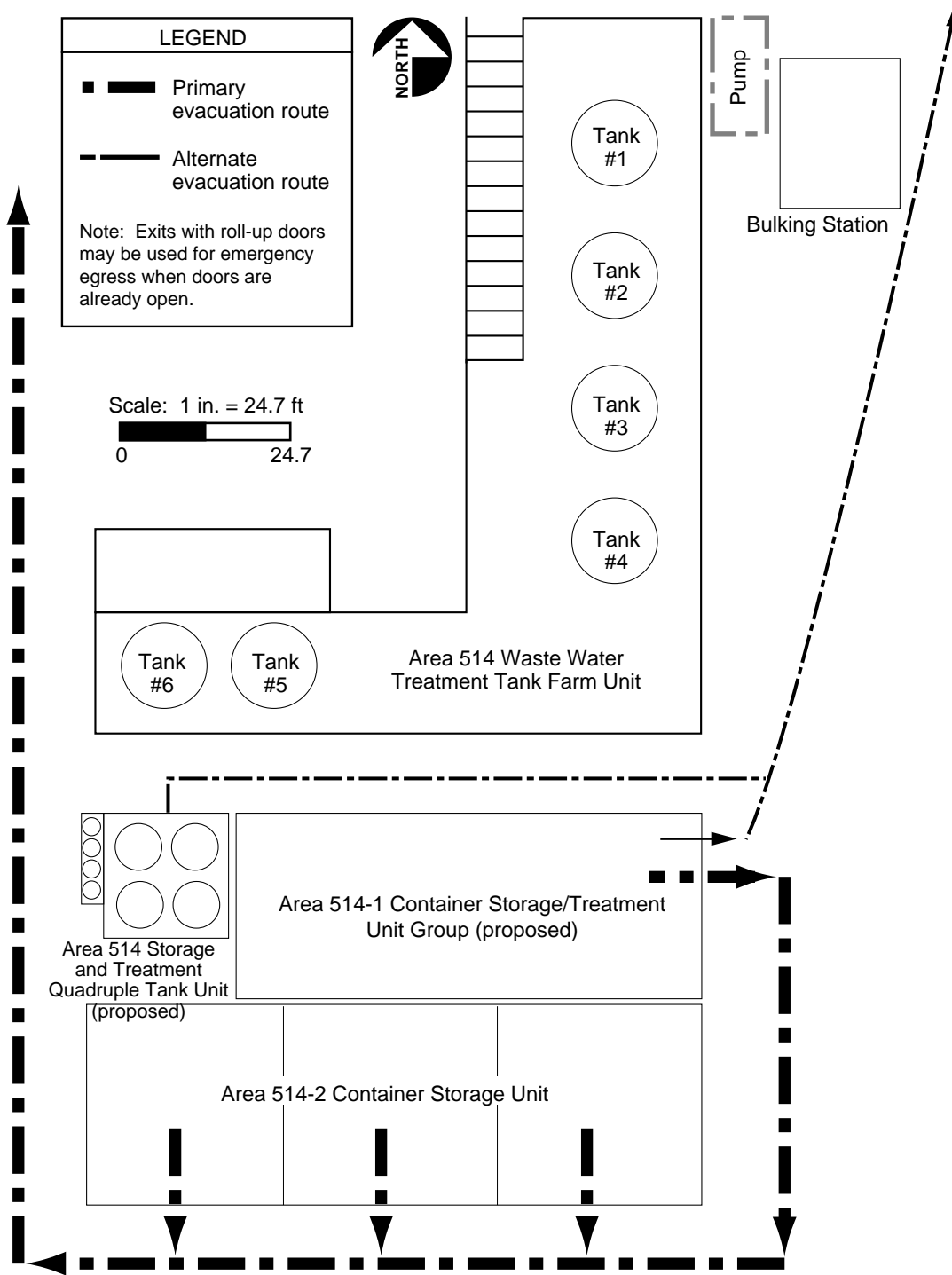
**Figure 7-2. Area 514-3 Container Storage Unit Evacuation Routes and Emergency and Safety Equipment and Utility Locations**



**Figure 7-3. Area 514 Waste Water Treatment Tank Farm Unit Evacuation Routes and Emergency Safety Equipment and Utility Shut-Off Locations**



**Figure 7-4. Building 513 Evacuation Routes, Emergency Safety Equipment and Utility Shut-Off Locations**



**Figure 7-5. Evacuation Routes and Emergency Equipment Locations for Areas 514-1 and 514-2 Container Storage Units and Area 514 Storage and Treatment Quadruple Tank Units**

An internal paging system is installed in the Area 514 Facility. This system will be accessed by dialing a designated number on a touch telephone. This system can be used to notify facility personnel of existing hazards during an emergency or to communicate an evacuation order.

Several mobile telephones are available to HWM personnel. These may be used in emergencies. HWM also has several hand held portable communication radios available for emergencies.

## **7.2 External Communication System**

The LLNL Fire Department is notified of an incident at the Area 514 Facility through the Emergency Dispatcher who is summoned by dialing ext 911 on any telephone.

The Emergency Dispatcher alerts the LLNL Fire Department emergency responders and also may warn personnel over the site-wide public address system of any dangers and necessary precautions, and may also provide evacuation instructions. For localized emergencies, this public address system can be used to selectively warn Area 514 Facility personnel and on-site neighbors.

## **7.3 Fire Suppression System**

Fire suppression equipment at the Area 514 Facility includes fire extinguishers and water supply lines. The Building 513 Container Storage Unit will be upgraded in 1995 or 1996 to incorporate a higher fire protection rating. The proposed upgrade will include the following: a new secondary containment system with double-walled trench drainpipe and underground double-walled tank. The sprinkler system will be in compliance with National Fire Protection Association (NFPA) Standard 13, standard for the installation of sprinkler systems. The type of sprinkler heads, temperature of the heads, and location of the heads may change as necessary to improve the level of fire protection.

The planned configuration of the system will be as follows: Twenty-two sprinkler heads will be installed a maximum of 12 inches from the ceiling in the building. The action of the water flowing through the sprinkler line will activate an alarm at the Emergency Dispatch Center, and the LLNL Fire Department will respond.

To ensure that sprinkler systems operate properly, employees and supervisors will observe the following:

- Enclose sprinkler heads in protective cages wherever mechanical damage may be likely
- Keep normal and maintenance-type heat sources (i.e., torches or soldering irons) away from sprinkler heads

- Keep equipment and other materials away from sprinkler heads to ensure that they do not interfere with the water-spray pattern
- Allow an 18-in. clearance below sprinkler heads
- Prohibit climbing on pipes or placing ladders against sprinkler pipes or heads
- Provide at least a 3-ft clearance around sprinkler control valves to allow fire safety personnel access to them.
- Operations in the Building 513 Container Storage Unit shall cease if fire protection is not operating or available.

To prevent uncontrolled reactions or evolution of gases, water reactive wastes are stored in watertight containers.

To accommodate the water from the sprinkling system, extra secondary containment will be provided by the portion of the cell below the retention pipe, and an underground tank system. An overflow pipe will be located above the low point of the unit. A leak detection cable with an alarm and locator system will be installed in the annular space of the pipe. The tank will have double-wall construction.

As previously stated, leak detection units will also be installed in the annular spaces of the piping and tank. The interior of the tank will be equipped with a high and low level indicator. The tank will be bolted to concrete hold-downs. The tank will also be equipped with a pressure relief vent valve and 24-in. access hole. The tank will be accessible by covered holes in the asphalt grade.

The fire detection and alarm system will detect the presence of heat in the unit, automatically start the sprinklers in the unit, and alert the LLNL Fire Department. Testing (performance verification) on the sprinkler system will be performed quarterly and according to a published schedule. The tank and piping systems will be thoroughly inspected on an annual basis. The tank and piping may undergo pressure testing if deterioration is detected. The leak detection signals will include both audible horn and visible blue lights that will be monitored during operating hours by yard technicians working in the immediate area of the unit. The tank level indicators and leak detection lights will be connected to lights on the leak detection panel, located in the near vicinity of the unit, and the high-level indicator will be connected to a warning horn.

### 7.3.1 Fire Extinguishers

Fire extinguishers are manually operated, portable devices that will discharge an extinguishing agent when properly activated. They are used to control a fire during the time between discovery and arrival of the LLNL Fire Department. They are located throughout the Area 514 Facility, as required by the National Fire Code, and additional fire extinguishers are located in areas of specific fire hazards. The locations and

types of fire extinguishers in the Area 514 Facility are shown in Figures 7-1 through 7-5. All Hazardous Waste Management Division personnel actively engaged in operations involving hazardous waste are trained in the use of fire extinguishers. **Only** trained personnel are instructed to use fire extinguishers. Fire extinguishers are used to control small fires during the time between discovery and arrival of the LLNL Fire Department.

Type A extinguishers are used to control fires starting from ordinary combustibles (i.e., paper or wood) and usually contain water.

Type ABC extinguishers are used to control fires starting from either ordinary combustibles, flammable liquids, or electrical and usually contain monammonium phosphate.

Type BC extinguishers are used to control fires starting from either flammable liquids or electrical and usually contain Purple K Powder (potassium bicarbonate), sodium bicarbonate, CO<sub>2</sub>, or Halon.

Type D (metal-x) extinguishers are used to control fires starting from flammable metals (i.e., magnesium) and usually contain sodium chloride.

#### 7.3.2 Water Supply

Water supply for all purposes, including emergency response, is provided to the Area 514 Facility as a part of the site-wide utility infrastructure under the administration of LLNL Plant Engineering Department. Water from the Hetch Hetchy system is delivered under gravity flow via a 6.1-mile-long pipeline to three water storage tanks located on a hill at the south end of the Sandia National Laboratories site. If for some reason this water supply is cut off from the Hetch Hetchy source (i.e., pipeline rupture, earthquake, etc.), water supply to the storage tanks can be restored through a backup tie-in to the Zone 7 Water District.

The storage tanks have a combined capacity of 1,280,000 gal. Water is delivered from these tanks to the piping grid underneath the LLNL and Sandia National Laboratories sites via a 10-in. pipeline and a 16-in. pipeline. Water pressure in the piping grid varies from 90 psi on the south to 105 psi on the north.

The Area 514 Facility is served by water lines that are used for operations and for drinking water, eye washes, etc. Potable water is supplied to Building 514, and several hose bibs are located in the yard for general housekeeping purposes. These hose bibs are fitted with screw-on backflow prevention devices.

In the event of unrestrained water flow from damaged or ruptured utilities Hazardous Waste Management Facility Operations Technicians assigned to the Area 514 Facility are cognizant of all utility shut-offs, including water, within the facility. The locations of utility shut-offs are shown in Figures 7-1, 7-3, and 7-4.

In the event of unrestrained water flow from damaged or ruptured utilities outside of the Area 514 Facility, the LLNL Fire Department and emergency service Plant Engineering personnel are available to shut off flow to the incident area.

In the vicinity of the Area 514 Facility two fire hydrants (Nos. 512 and 513) can be used for emergency response. The locations of these hydrants are shown in Figure 7-6. The volumetric flow rate for fire hydrants in this area is 1,110 gal per minute. The static pressure is 67 psi and residual pressure is 56 psi.

The Area 514 Facility has a water hookup fitted with a 1.5-in. flexible hose that is compatible with standard fire hose connections. This hose is used for standard operating practices but could also be used as backup or auxiliary fire hoses, if necessary. The location is indicated in Figure 7-1.

## **7.4 Response Equipment**

Several categories of emergency response equipment are available at LLNL. This includes release response equipment, response vehicles and heavy equipment, site safety equipment, PPE, emergency assembly point kits, and MSDSs.

### **7.4.1 Release Response Equipment**

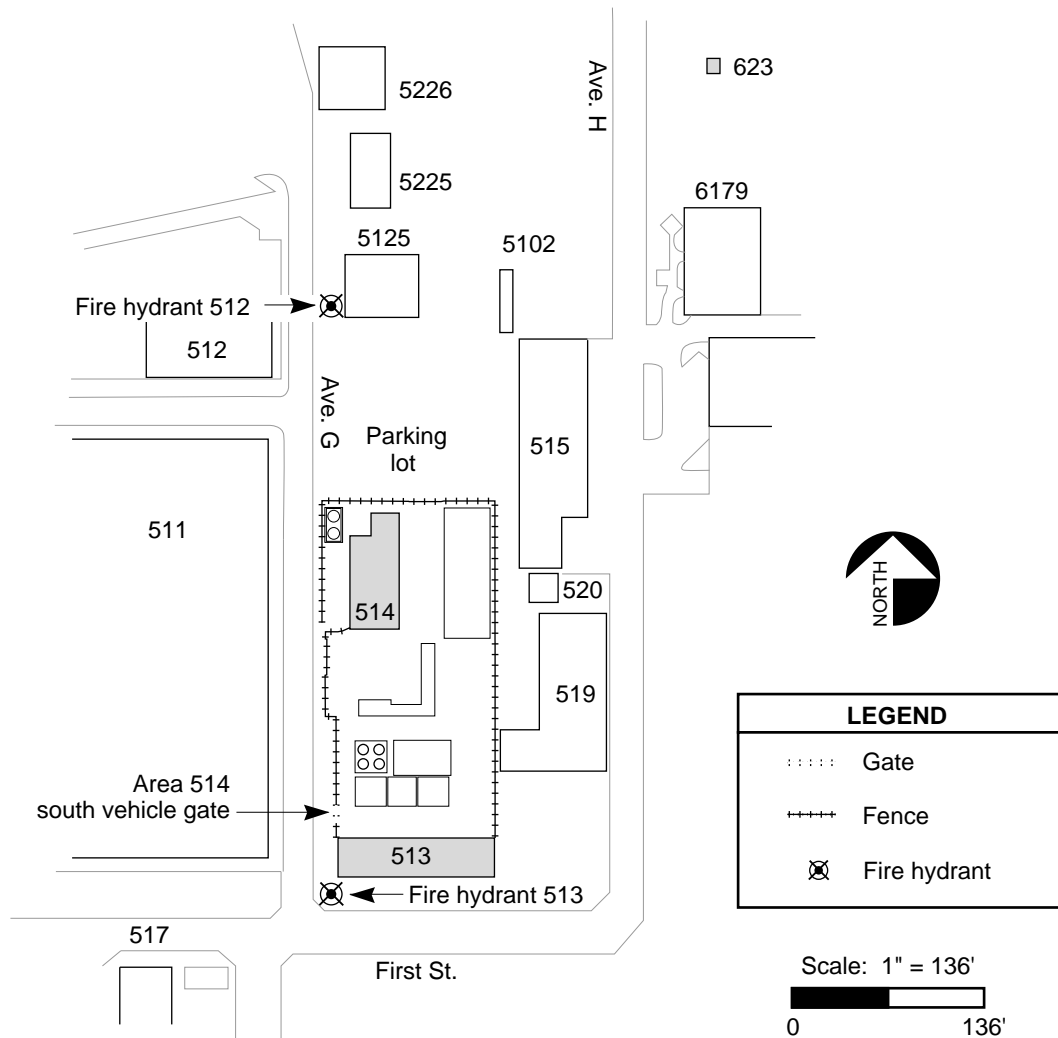
For small (Level 1) incidents, the Hazardous Waste Management Division has access to the contents of emergency spill kits in several key locations at the Area 514 Facility (see Figures 7-1 through 7-5). These kits contain all necessary equipment needed to contain a small release. Appendix E provides a complete spill kit inventory and the capabilities and limitations of each item.

The Hazardous Waste Management Division also maintains a release response trailer containing bulk quantities of release response equipment that are used to support the Fire Department when mitigating releases from Level 2, 3, and 4 incidents.

For large (Level 2, 3, or 4) incidents, the LLNL Fire Department maintains or has access to a mobile supply of equipment required to mitigate diverse emergencies. The Special Services Unit 1 (at Fire Station 1, Building 323) is a hazardous materials response vehicle operated by the LLNL Fire Department. It contains spill kits, absorbents, acid suits, encapsulating hazardous materials suits, self-contained breathing apparatus, test kits, and hazardous materials reference information.

### **7.4.2 Response Vehicles and Heavy Equipment**

In case of a fire, explosion, or large release of hazardous waste, fire fighting equipment, containment, and emergency equipment is available for use. All LLNL Fire Department vehicles are equipped with radios on LLNL channels, Twin Valley Mutual Aid channels, and the State Mutual Aid channel. Fire Station 1 (Building 323) contains one pumper, one fire truck, two four-wheel drive command vehicles, two auxiliary pumpers, one primary and one reserve ambulance, a crash truck, and the Special Services Unit 1 for



**Figure 7-6. Hydrant Locations for the Area 514 Facility**

hazardous materials response. Fire Station 2 (Building 870) contains one pumper, one wild land/minipumper, and one ambulance.

The LLNL Fire Department can respond within minutes to a medical emergency with an ambulance. Patients are taken to the LLNL medical clinic which is located near the east gate of the LLNL main site, or for severe accidents, are taken to ValleyCare Medical Center in Livermore or another hospital as specified by the Alameda County Emergency Medical Services district representative.

A variety of heavy equipment is available from Plant Engineering during an emergency. This equipment includes but is not limited to compressors, cranes, cutting torches, forklifts, generators, pumps, scrapers, and bulldozers.

All emergency equipment is maintained on a regular basis to ensure that it is operational at all times. The water trucks are kept full of fuel and water for preparedness. Preventative maintenance checks are performed by the Automotive Fleet maintenance crew according to the recommended factory schedule. Emergency equipment belonging to the LLNL Fire Department and Plant Engineering is listed in Part VIII of the Part B Permit Application.

#### 7.4.3 Site Safety Equipment

Eyewash stations, showers, and fire extinguishers are located throughout the Area 514 Facility as shown in Figures 7-1 through 7-5.

#### 7.4.4 Personal Protective Equipment

Safety glasses and solid-toe shoes are required to be worn at all times when working in waste management operational areas. Booties are worn over shoes for certain activities, such as decontamination, or in designated areas where radioactive containers are opened. Coveralls or equivalent are required to be worn at all times by operators handling waste containers. Leather, acid-, base-, or solvent-resistant gloves are worn as appropriate for the waste handling activity. Face shields, goggles, or other facial and eye protection is required to be worn in accordance with the FSPs and OSPs when handling open containers of liquid waste. The level of PPE is assigned based upon the activity (see Section 3.3.2).

Protective clothing for normal daily operations is maintained in a PPE locker located in various portions of the Area 514 Facility (see Figures 7-1 through 7-5). Although clothing in the PPE locker is intended for protection during routine waste handling operations, contents may be accessed during emergency response procedures to supplement protective clothing stored in the emergency spill kits. The daily and emergency PPE lockers are restocked on a weekly basis and contain the items listed below:

- Assorted gloves (cotton, leather, neoprene, Viton, exam, and Nitrile)

- Booties,
- Coveralls, anticontaminant (Tyvek® or equivalent), disposable
- Ear plugs
- Goggles, fogless clear.
- Headgear, face shields, and face shield windows
- Lab aprons (chemically resistant)

Two self-contained breathing apparatus (SCBA) units are available at the Area-514 Facility, for use by qualified personnel during initial release/emergency response actions. Additional SCBA units are available from the LLNL Fire Department response vehicles, including the Special Services Unit 1 hazardous materials emergency truck, and from the LLNL Respirator Services group.

Following evaluation of hazards by the appropriate Hazards Control Department Health and Safety discipline (Industrial Hygienist, Health Physicist or other qualified individual), the use of air-purifying respirators may be authorized during release/emergency responses. With this authorization, NIOSH-approved, full face piece, air-purifying respirators equipped with combination acid gas/organic vapor/high efficiency particulate air (AG/OV/HEPA) filter cartridges are available from supplies kept for normal Hazardous Waste Management operations in an access-controlled locker in B-514. Issue-point control for these respirators is maintained by the area's Facility Supervisors. Alternative types of air-purifying respirators selected by the cognizant Health and Safety discipline are available from the LLNL Respirator Services group in Building-324 (located in the hallway between Rooms 115 and 107).

These respirators will only be given to personnel who have been properly trained and fitted for respirator use and are listed on the Respirator Approval list posted in the respirator locker at each of the respective facilities. Individuals who have not been trained or fitted for respirator use may not participate in the waste handling operations requiring the use of respirators.

The respirator wearer is required to inspect the respirator before using it to ensure it is in proper working condition. Each stored respirator is inspected on a monthly basis by the respirator custodian for physical integrity and to ensure that the one-year shelf life has not been exceeded.

The respirator lockers are stocked on demand. The number of respirators maintained varies in the Hazardous Waste Management Facilities. The inventory is dependent on the number of employees in the facility who are approved to wear respirators. Since staff levels vary over time, the number of respirators maintained also varies. At a minimum, the respirator locker contains 9 MSA full-face air-purifying respirators with

AGOV/HEPA cartridges: 3 small, 3 medium, and 3 large. It must be noted that respirators are stocked primarily for planned work that require respiratory protection.

Additional respirators (with a variety of cartridges) can be delivered immediately from the LLNL Respirator Shop if necessary. This shop is responsible for distributing, servicing, and cleaning all respirators used at LLNL. Respirators are worn once and are then discarded to respirator receptacles located at each of the facilities. The used respirators are delivered to the respirator shop by the respirator custodian.

The LLNL *Health and Safety Manual* contains more information on the LLNL policy on respirator use.

#### **7.4.5                    Emergency Assembly Point Kit (Self-Help Kit)**

Protective and emergency equipment is stored in the Self-Help Kit located at the evacuation assembly point for the Area 514 Facility (see Figure 8-1 in Section 8). This kit is maintained for major emergencies that require the evacuation of Area 514 Facility personnel. It contains first-aid equipment, including a first-aid kit, blankets and stretcher. It also includes the following safety equipment: flashlights, safety glasses, gloves (plastic, leather, and cotton), and hard hats, among other items. This kit is inspected on a monthly basis and items are replaced when necessary.

#### **7.4.6                    Material Safety Data Sheets**

Material Safety Data Sheets (MSDSs) list the characteristics and hazards of a chemical. An MSDS can be obtained in three ways at LLNL: (1) from the Hazards Control MSDS Hotline (423-2122), (2) from a chemist in the HWM Technology and Information Section (423-6059, 422-8834), and (3) from the Hazardous Waste Management Division's Requisition Control Office (422-9837). The Hazards Control Department maintains files of MSDS's for chemicals routinely used at LLNL. Copies of these MSDS's are available on request. Supply and Distribution also has MSDSs for all products that they purchase.

### **7.5                      Emergency Lighting**

See Section 6.2.3 for the types of emergency equipment available in the event of a power outage.

### **7.6                      Decontamination Equipment**

The Hazardous Waste Management Division maintains equipment that is available to decontaminate areas that were in contact with the released hazardous, radioactive or mixed materials or wastes. This includes containment booms, mops, brooms, shovels, a steam cleaner, pressure washer and electric floor scrubber and a mercury vacuum cleaner. The steam cleaner and pressure washer are stored at the Support Services Group Equipment yard, B419 and are inspected monthly.

The Area 514 Facility maintains a wet/dry vacuum cleaner. This vacuum cleaner is inspected on a monthly basis. Also located in this room (in a cabinet) are buckets, squirt bottles, rags, wipes, and cleaning solutions. This cabinet is restocked on a monthly basis, or whenever necessary. Chemical solutions used in decontamination operations are presented in Appendix F.

The LLNL Fire Department also maintains decontamination supplies for personnel and/or equipment decontamination. *Tactical Plan 1607* in the *LLNL Fire Department Policies and Procedures, Volume 1* (LLNL, 1987) contains a discussion of the LLNL Fire Department's decontamination equipment.

## **8. EVACUATION PLAN**

The Evacuation Plan for the Area 514 Facility and for the LLNL main site are established in the event that an emergency requires the evacuation of either the Area 514 Facility or the site.

### **8.1 Area 514 Facility Evacuation Plan**

Emergency evacuation notification of the Area 514 Facility personnel is made on the LLNL site-wide emergency paging system, by the Area 514 Facility internal paging system, and through verbal instructions from the Supervisor or facility personnel. Evacuation procedures for the general facility staff, the Area 514 Facility Supervisor (or alternate), and the Assembly Point Leader are outlined in the following sections.

#### **8.1.1 Area 514 Facility Staff**

Area 514 Facility Staff (including Technicians/Technologists) follow these steps in a large-scale emergency (that requires evacuation):

- Remain in the Area 514 Facility until it is safe to leave
- Shut down operating equipment
- Upon hearing the evacuation announcement, leave the building/facility by the closest safe exit and go to the designated assembly point; in general, exit to the west (or upwind) from the nearest door or personnel gate; see Figures 7-1 to 7-5 for locations of the evacuation routes for each waste management unit in the Area 514 Facility
- Notify others who do not seem to be aware of the evacuation order
- Wait at the Emergency Assembly Point for instructions from the Emergency Management Center; in the interim, follow the Assembly Point Leaders instructions.

### 8.1.2 Area 514 Facility Supervisor or Alternate

The Area 514 Facility Supervisor or alternate follows these steps in a large-scale emergency (that requires evacuation):

- Notify personnel of the evacuation order
- Remove the Building/Facility Visitor Log to determine the number of visitors inside the facility; take this book to the emergency assembly point
- Act as Sweep Team Leader; help the Assembly Point Leader organize a sweep team
- Conduct a rapid sweep of the Area 514 Facility to locate unaccounted for personnel who may be injured, provide assistance to any person in trouble, and observe the general condition of the Area 514 Facility
- Ensure that all personnel have left their respective operational areas. Notify individuals who do not seem aware of the evacuation order
- Report Area 514 Facility status to the Hazardous Waste Management Facility Assembly Point Leader using radio communication or a “runner”
- Go to the Emergency Assembly Point, await instructions from the Emergency Management Center; in the interim, follow the Assembly Point Leader’s instructions.

### 8.1.3 Assembly Point Leader

According to the self-help plan, the Assembly Point Leader follows these steps in a large-scale emergency (that requires evacuation):

- Remain in the Area 514 Facility until it is safe to leave
- Go to the Area 514 Facility designated Emergency Assembly Point
- Establish a command post
- Organize a Sweep Team for the purpose of locating and rescuing trapped, injured, or incapacitated employees within the facility; locating/controlling fires, leaks, and releases; and assessing structural damage to the facility
- Arrange for transportation and first aid for injured employees

- Maintain direct communication with the Sweep Team Leader and Zone Supervisor by radio communication or “runner”
- Communicate the situation assessment to the Emergency Management Center and emergency-response forces (as described in the LLNL *Draft Emergency Plan*).

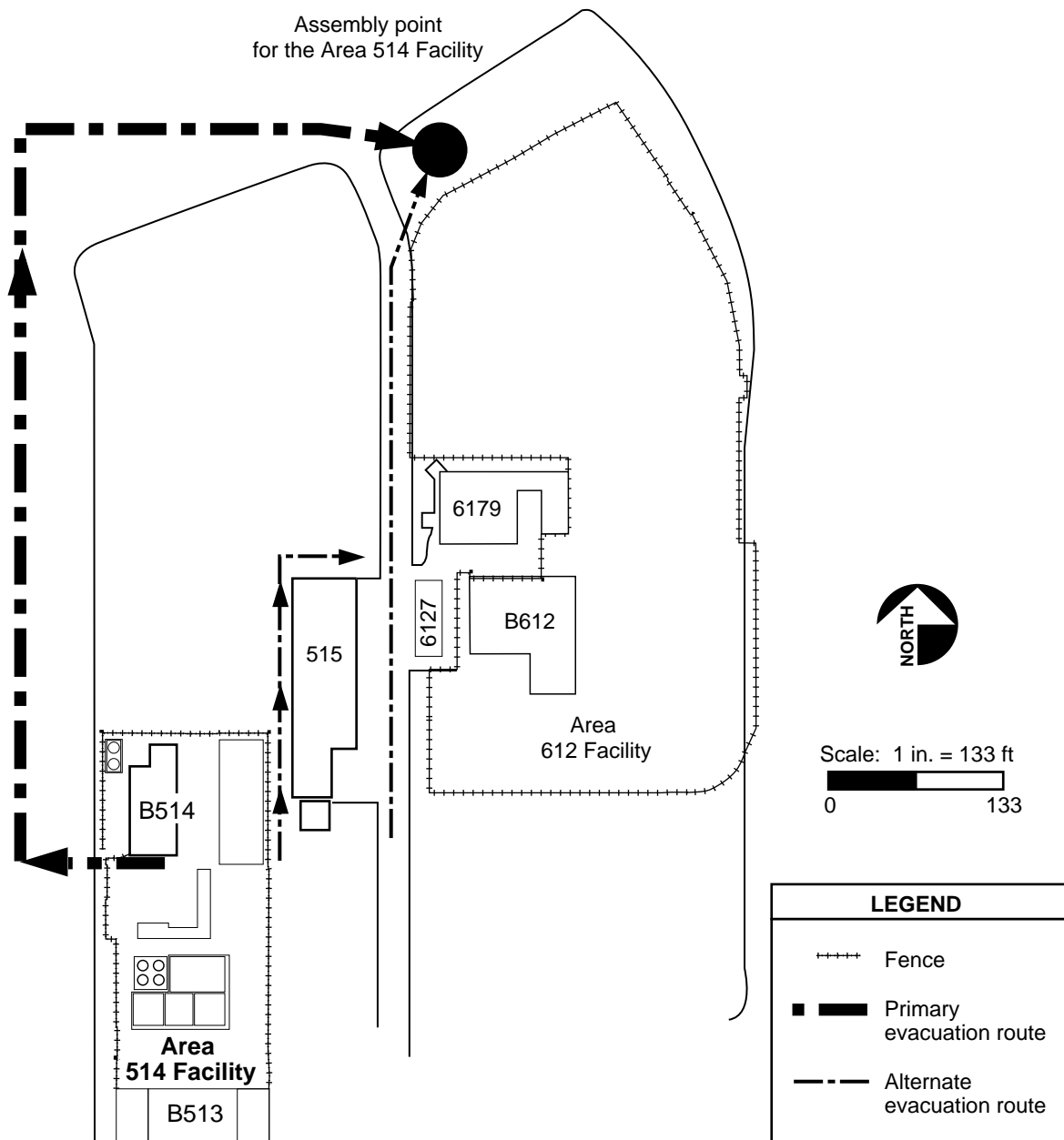
## 8.2 Evacuation Routes

Personnel should evacuate through the nearest exit unless the exit is blocked or could place the individual in danger. In general, primary evacuation routes are to the west of the facility. If this is unsafe or otherwise unfeasible, escape should be made through the nearest alternate exit. Since prevailing winds are from the west, western evacuation routes are recommended to stay upwind of any hazardous waste release. The fire hydrant locations which are in close proximity to the B514 facility are shown in Figure 7-6. Primary and alternate routes for evacuation from the general Area 514 Facility are presented in Figure 8-1. Primary and alternate routes for evacuation from specific units in the Area 514 Facility are presented in Figures 7-1 through 7-5. Evacuees are required to report to the assembly point for the Area 514 Facility, which is shown in Figure 8-1.

## 8.3 LLNL Site-Wide Evacuation Plan

If a major emergency develops that requires the evacuation of personnel from all or part of the LLNL main site, the Protective Force Division will implement actions to control evacuating personnel, protect the on-site emergency scene, and coordinate activities with outside police organizations. The Protective Force Division will initiate one of the operational responses described in the LLNL *Emergency Evacuation Plan*. An event requiring evacuation could be caused by an on-site or off-site emergency such as an earthquake, fire, explosion, or major toxic or radioactive material release. The Laboratory Emergency Duty Officer is authorized to implement area or site-wide evacuation procedures if deemed necessary after receiving a situational assessment from the Incident Officer. Authority and procedures for evacuating a single facility or a small area are not included in this Plan. In either case, the Fire Department controls the on-site emergency, and the Protective Force Division controls personnel.

The *Emergency Evacuation Plan* is a guide for the communications operator and the Protective Force Division’s supervisor, who is responsible for sending personnel to the most affective area of the LLNL main site to direct traffic. This Plan includes several options that need to be taken into consideration. These factors are wind direction, magnitude of the problem, time of day, and day of the week. Coordination with outside law enforcement agencies is also necessary so that traffic exiting LLNL is allowed to flow in an orderly fashion away from the threat and into the outlying community. See Appendix VIII-E of the Part B Permit Application for specific evacuation routes from the LLNL site.



**Figure 8-1. Area 514 Facility Emergency Evacuation Routes**

## **9. RECORD KEEPING AND INCIDENT REPORTING**

### **9.1 Internal Reporting**

Employees shall notify the Hazardous Waste Management Area 514 Facility Operations Supervisor of all release incidents (large or small), and the Fire Department of all large incident releases (exceeding Level 1), fires, or other emergencies. The Supervisor will gather preliminary information and then must immediately notify upper management, the Hazards Control ES&H Team, and the Environmental Analyst.

The Environmental Analyst evaluates the incident to determine what was released and if the incident is reportable to a State or Federal agency. He or she prepares an internal incident report for all incident levels and submits these to Environmental Protection Department and other LLNL management. A copy of this report is filed by Hazardous Waste Management Division.

An employee who becomes ill or is injured as a result of a job-related accident must notify his supervisor and report to Health Services. Health Services personnel will then collect pertinent information and forward it through the Hazards Control ES&H Team to the employee's department for analysis.

The Environmental Protection Department management, after being informed of a major accident or high-risk incident, must ensure that an incident analysis takes place with the objective of providing information about the nonidentified hazards or less-than-adequate controls that resulted in the incident. Recommendations for corrective measures will be included in the report, and copies shall be distributed to management, Hazards Control, and others who will benefit from information contained in the report. Hazards Control maintains a central file of all incident analysis reports and provides follow-up information. Summary reports are prepared by Hazards Control personnel and are freely distributed within LLNL.

### **9.2 External Reporting**

Releases must be reported to a variety of agencies under different circumstances. In all instances, both verbal and written notification are required.

The Environmental Protection Department (EPD) responds to all reports of releases or other environmental occurrences through a well-established reporting process. EPD has established a 7-days-a-week, 24-hours-a-day, on-call, rotational position called the Environmental Duty Officer (EDO), who can be reached by pager or cellular phone at any time. The EDO determines the reporting requirements, works with environmental analysts and with Laboratory management on the process of notifying federal, state, and local regulatory agencies and DOE, and provides advice on immediate clean-up and monitoring necessary to protect the environment. The EDO responds to occurrences throughout LLNL, in addition to HWM facilities.

### 9.2.1

#### Verbal Reports

Whenever the release could threaten human health, safety, or the environment outside the LLNL facility boundaries, verbal notifications are necessary to agencies listed in Table 9-1. A release could threaten health and safety outside the LLNL facility if any of the following conditions is met:

- The release directly results in an injury or illness off-site, that requires medical attention
- The exposure of the public to the released material exceeds the American Conference of Governmental Industrial Hygienist's (ACGIH) allowed threshold limit
- Requires evacuation of the population surrounding the Laboratory.

A release threatens the environment if the following condition is met:

- The released material migrates outside the LLNL facility boundaries and the quantity of the material outside the facility meets or exceeds the reportable quantity (RQ) defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Whenever the release could threaten human health, safety, or the environment within LLNL boundaries, verbal notifications are necessary to agencies listed in Table 9-2. Criteria for determining if the health and safety of LLNL employees are threatened are as follows:

- The incident results in injuries to personnel that require medical attention

**Table 9-1. Verbal Reports to Agencies for a Release That Threatens Health and Safety Outside LLNL Boundaries**

Agency	When	Phone Number
California Office of Emergency Services (OES)	Immediately after discovery	(800) 852-7550
Department of Toxic Substances Control, Region 2	Immediately after discovery	(510) 540-3739
National Response Center	Immediately after releasing PCBs greater than 1 lb Within 24 hours after releases of PCBs greater than 10 lb	(800) 424-8802
EPA Region IX	Immediately after discovery	(415) 744-1120
San Francisco Regional Water Control Board	Immediately after discovery	(510) 286-1255 8 am to 5 pm. OES after normal work hours
Central Valley Regional Water Control Board	Immediately after discovery	(916) 255-3030

**Table 9-2. Verbal Reports to Agencies for a Release That Threatens Health and Safety Within LLNL Boundaries**

Agency	When	Phone Number
Department of Toxic Substances Control, Region 2	Immediately after discovery	(510) 540-3739

- The exposure of personnel to the released material meets or exceeds the American Conference of Governmental Industrial Hygienist's (ACGIH) allowed threshold limit
- The release requires the evacuation of the Area 514 Facility or other LLNL facilities.

A release threatens the environment if either of the following conditions is met:

- The quantity of released material at the LLNL facility meets or exceeds the reportable quantity (RQ) as defined in CERCLA
- The Environmental Analyst determines that the release constitutes a potential threat to the environment.

Whenever the Area 514 Facility contingency plan is implemented, verbal reports are also necessary to agencies listed in Table 9-2. The Area 514 Facility contingency plan must be implemented if any one of the following actions occurs:

- The Area 514 Facility is evacuated due to an incident
- The Area 514 Facility personnel require the LLNL Fire Department's assistance in handling an incident and cleaning up the release (e.g., the release is from a large or Level 2, 3, or 4 incident)
- The incident results in injuries to personnel that require medical attention.

All verbal reports will include the following:

- Name and telephone number of the reporter
- Name and address of the facility
- Time and type of incident (e.g., release or fire)
- Name and quantity of material(s) involved, to the extent known
- Extent of injuries, if any

- Possible hazards to human health or the environment outside the LLNL facility boundaries
- Actions taken and status of the facility.

All verbal notification to the U.S. Department of Energy for hazardous releases are completed in accordance with DOE Order 5000.3B (Occurrence Reporting).

The Operations and Regulatory Affairs Division Leader (or designee) of LLNL's Environmental Protection Department is responsible for all required verbal notifications to State or Federal agencies.

### 9.2.2 Written Reports

Agencies listed in Table 9-3 must receive written reports for all releases that could threaten human health and the environment outside the LLNL facility boundaries.

Whenever a hazardous waste release could threaten human health, safety or environment within LLNL, or whenever the Area 514 Facility contingency plan is implemented, the Environmental Protection Agency Region IX Administrator and the Department of Toxic Substances Control, Region 2, must be notified in writing. The due date for the report and the agency addresses for these two agencies are the same as shown in Table 9-3. The California Office of Emergency Services need not be notified unless the incident is assessed as representing a threat to human health and the environment outside the LLNL facility boundaries.

All written reports will include the following:

- Name, address, and telephone number of the owner or operator (LLNL)
- Name, address, and telephone number of the Area 514 Facility

**Table 9-3. Written Reports to Agencies for a Release that Threatens Human Health and Safety**

Agency	Notification Required	Address
Environmental Protection Agency	Within 15 days of the incident	Regional Administrator U.S. EPA Region IX 215 Fremont St. San Francisco, CA 94195
California Office of Emergency Services	Within 5 days of the incident	Office of Emergency Services 2800 Meadow View Road Sacramento, CA 95832
Department of Toxic Substances Control, Region 2	Within 15 days of the incident	California EPA Department of Toxic Substances Control 700 Heinz Avenue Suite 200 Berkeley, CA 94710

- Date, time, and type of incident (e.g., release, fire, or explosion)
- Name and quantity of material(s) involved
- Extent of injuries, if any
- Assessment of actual or potential hazards to human health or the environment, when this is applicable
- Estimated quantity and disposition of recovered material that resulted from the incident
- Notice that incompatible wastes were not being handled until cleanup procedures were completed and that all equipment listed in the contingency plan is cleaned and fit for its intended use.

All written notification to the U.S. Department of Energy for hazardous and radioactive releases are completed in accordance with DOE Order 5000.3A.

The Environmental Operations Group's Environmental Analyst (assigned to the Area 514 Facility) will write the appropriate reports to regulatory agencies for incidents occurring during normal working hours. The Environmental (Protection) Duty Officer (EDO) evaluates, classifies, and writes all necessary reports for incidents occurring during off-work hours. The EDO position is one that rotates among qualified Environmental Analysts within the Environmental Protection Department. Each EDO is on-call 24 hours a day for a one week period (including weekends and holidays).

All written reports will be reviewed and forwarded to the appropriate regulatory agency by the Environmental Protection Department Head.

In addition, emergencies requiring activation of the Emergency Management Center will be subject to the reporting requirements of the LLNL *Draft Emergency Plan*. The Deputy Crisis Manager supervises the investigation of the incident and the preparation of the Investigation Report.

All Hazardous Waste Management Division related incident reports (both reportable and recordable) are maintained in the files at the Hazardous Waste Management Facility. These files represent Hazardous Waste Management Facility operating record.

## 10. REFERENCES

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- International Conference of Building Officials (1988). *Uniform Building Code*, Western Fire Chiefs Association, Whittier, CA.
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- LLNL, (1995), *Self-Help Plan*, Hazardous Waste Management Division, Fiscal Year 1995, February 1995, EPD, Lawrence Livermore National Laboratory, Livermore, CA.



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## **APPENDIX A**

### **Personal Protective Equipment Guidelines**



## Appendix A. Personal Protective Equipment Guidelines \*

Waste Category	Examples of Waste	Gloves	Protective Clothing	Respirator (see note)
Acid Waste	Mineral Acid (sulfuric, hydrochloric, hydrobromic)	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC** boots or polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
	Organic Acid	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC boots or polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
	Perchloric Acid	Call LLNL Fire Department (ext 911)		
	Hydrofluoric Acid	Call LLNL Fire Department (ext 911)		
	Chromic Acid	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC boots or polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
Aqueous Waste	Spent photo chemicals, rinse waters, spent plating solutions, machine coolants	Neoprene	Polyethylene coated full body Tyvek coveralls or full body, chemically resistant, protective coveralls (Chemrel or equivalent) and polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
Caustic Waste	Sodium hydroxide, potassium hydroxide, calcium hydroxide	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC boots or polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
	Ammonia	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC boots or polyethylene booties	Full-face respirator with ammonia cartridge
Flam-mable Liquids Waste	Gasoline, acetone, toluene, xylene, ethanol	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC boots or polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
PCB Waste	PCB-contaminated oil, transformer fluid, capacitor fluid	Wear poly laminate (Silver Shield <sup>®</sup> or Safety 4-H <sup>®</sup> ) and neoprene or nitrile gloves	Full body, chemically resistant, protective coveralls (Chemrel or equivalent) and PVC boots or polyethylene booties	Full-face air-purifying respirator with AGOV/HEPA cartridges <sup>†</sup>
Strong Oxidizers	Chromic acid, nitric acid (above 40%), perchloric acid (above 40%)	Chemical specific selection required. To be determined by Hazards Control		
	Nitrates, perchlorates, chlorine, chlorites, chlorates, peroxides, and permanganates	Chemical specific selection required. To be determined by Hazards Control		
Water Reactives <b>DO NOT USE WATER</b>	Lithium hydride, sodium and potassium metals, uranium turnings, and acetyl chlorides	Call LLNL Fire Department (ext 911)		

\* Contact Hazards Control Safety Team to verify adequacy of equipment for specific release.

\*\* Polyvinyl chloride.

† Acid gases/organic vapors/HEPA (AGOV/HEPA).

**NOTE: Respirator use is dependent on quantity, type, and location of material released. They are to be used only within limitations of respirator and cartridge. Air purifying respirators will only be issued following an assessment by the appropriate Hazards Control Safety discipline. SCBA respirators may be substituted.**



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## **APPENDIX B**

### **Equipment to Contain and Absorb Spills**



## Appendix B. Equipment to Contain and Absorb Releases \*

Waste Category	Type of Equipment	Material	Additional Equipment*
Acid	absorbent socks	Polyethylene pulp	polypropylene shovels polyethylene bags brooms (chemically resistant) dust pan (chemically resistant) caution tape pH paper
	absorbent (loose)	Silicates (Floor Dry: diatomaceous earth or equivalent)	
	acid neutralizer/absorbent	Magnesium oxide, sodium bicarbonate, Neutrasorb, Kolor-Safe acid, or equivalent	
Aqueous	absorbent socks	Polyethylene pulp	polypropylene shovels polyethylene bags brooms (chemically resistant) dust pan (chemically resistant) caution tape
	absorbent (loose)	Silicates (Floor Dry: diatomaceous earth or equivalent)	
Caustic	absorbent socks	Polyethylene pulp	polypropylene shovels polyethylene bags brooms (chemically resistant) dust pan (chemically resistant) caution tape pH paper
	absorbent (loose)	Silicates (Floor Dry: diatomaceous earth or equivalent)	
	caustic neutralizer	Spill-x-c, Neutrakit, Kolor-Safe base, or equivalent	
Flammable Liquids	absorbent socks	Polyethylene pulp	polypropylene shovels polyethylene bags brooms (chemically resistant) dust pan (chemically resistant) caution tape
	absorbent (loose)	Silicates (Floor Dry: diatomaceous earth or equivalent)	
	solvent absorbent	Spill-x-s, Solusorb, or equivalent	
	detergent	Powerclean 151 or equivalent	
Strong Oxidizers	absorbent socks	Polyethylene pulp	polypropylene shovels polyethylene bags
	absorbent (loose)	Silicates (Floor Dry: diatomaceous earth or equivalent)	brooms (chemically resistant) dust pan (chemically resistant) caution tape pH paper

\* See Appendix E (Emergency Spill Kit Supplies) for a more complete list.



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**APPENDIX C**

**Waste Absorption and  
Neutralization Guidelines**



## Appendix C. Waste Absorption and Neutralization Guidelines

Waste Category	Guidelines to Absorb and/or Neutralize
Acid	<p>Contain the release by surrounding it with absorbent socks or by diking the perimeter with scoops of loose absorbent material compatible with the substance released. Begin at the side(s) where flow is most rapid and on side(s) where release flows toward drains or other conduits to the environment.</p> <p>Next, cover the release with loose, compatible absorbent material, working from the perimeter inward toward the center. Use sufficient quantities to completely cover the liquid. An acid neutralizing absorbent may be substituted, if neutralization is desired. Carefully stir the absorbent-covered release with a shovel. The mixture will change color when the acid is neutralized.</p> <p>Very small releases may be contained and absorbed solely with an absorbent sock.</p> <p>When the release is completely soaked up, discard all absorbent material as hazardous waste. Use a shovel to scoop up the loose absorbent. A chemically resistant broom and dust pan may be used to sweep up absorbent residue.</p> <p>Use wetted absorbent towels or pads to clean surface area until it tests neutral with pH paper.</p>
Aqueous	<p>Contain the release by surrounding it with absorbent socks or by diking the perimeter with scoops of loose absorbent material compatible with the substance released. Begin at the side(s) where flow is most rapid and on side(s) where release flows toward drains or other conduits to the environment.</p> <p>Next, cover the release with loose compatible absorbent material, working from the perimeter inward toward the center. Use sufficient quantities to completely cover the liquid. Carefully stir the absorbent-covered release with a shovel.</p> <p>Very small releases may be contained and absorbed solely with an absorbent sock.</p> <p>When the release is completely soaked up, discard all absorbent material as hazardous waste. Use a shovel to scoop up the loose absorbent. A chemically resistant broom and dust pan may be used to sweep up absorbent residue.</p> <p>Use wetted absorbent towels or pads to clean surface.</p>
Caustic	<p>Contain the release by surrounding it with absorbent socks or by diking the perimeter with scoops of loose absorbent material compatible with the substance released. Begin at the side(s) where flow is most rapid and on side(s) where release flows toward drains or other conduits to the environment.</p> <p>Next, cover the release with loose, compatible absorbent material, working from the perimeter inward toward the center. Use sufficient quantities to completely cover the liquid. A caustic neutralizing absorbent may be substituted, if neutralization is desired. Carefully stir the absorbent-covered release with a shovel. The mixture will change color when the caustic is neutralized.</p> <p>Very small releases may be contained and absorbed solely with an absorbent sock.</p> <p>When the release is completely soaked up, discard all absorbent material as hazardous waste. Use a shovel to scoop up the loose absorbent. A chemically resistant broom and dust pan may be used to sweep up absorbent residue.</p> <p>Use wetted absorbent towels or pads to clean surface area until it tests neutral with pH paper.</p>

## Appendix C. Waste Absorption and Neutralization Guidelines (Continued)

Waste Category	Guidelines to Absorb and/or Neutralize
Flammable Liquid	<p>Contain the release by surrounding it with absorbent socks or by diking the perimeter with scoops of loose absorbent material compatible with the substance released. Begin at the side(s) where flow is most rapid and on side(s) where release flows toward drains or other conduits to the environment.</p> <p>Next, cover the release with loose compatible absorbent material, working from the perimeter inward toward the center. Use sufficient quantities to completely cover the liquid. Carefully stir the absorbent-covered release with a shovel.</p> <p>Very small releases may be contained and absorbed solely with an absorbent sock.</p> <p>When the release is completely soaked up, discard all absorbent material as hazardous waste. Use a shovel to scoop up the loose absorbent. A chemically resistant broom and dust pan may be used to sweep up absorbent residue.</p> <p>Use wetted absorbent towels or pads to clean surface.</p> <p>Seal contaminated clothing and absorbent material in a vapor-tight container.</p>
Acid Oxidizer	<p>Contain the release by surrounding it with absorbent socks or by diking the perimeter with scoops of loose absorbent material compatible with the substance released. Begin at the side(s) where flow is most rapid and on side(s) where release flows toward drains or other conduits to the environment.</p> <p>Next, cover the release with loose, compatible absorbent material, working from the perimeter inward toward the center. Use sufficient quantities to completely cover the liquid. An acid neutralizing absorbent may be substituted, if neutralization is desired. Carefully stir the absorbent-covered release with a shovel. The mixture will change color when the acid is neutralized.</p> <p>Very small releases may be contained and absorbed solely with an absorbent sock.</p> <p>When the release is completely soaked up, discard all absorbent material as hazardous waste. Use a shovel to scoop up the loose absorbent. A chemically resistant broom and dust pan may be used to sweep up absorbent residue.</p> <p>Use wetted absorbent towels or pads to clean surface area until it tests neutral with pH paper.</p>
Other Oxidizer	<p>Contain the release by surrounding it with absorbent socks or by diking the perimeter with scoops of loose absorbent material compatible with the substance released. Begin at the side(s) where flow is most rapid and on side(s) where release flows toward drains or other conduits to the environment.</p> <p>Next, cover the release with loose compatible absorbent material, working from the perimeter inward toward the center. Use sufficient quantities to completely cover the liquid. Carefully stir the absorbent-covered release with a shovel.</p> <p>Very small releases may be contained and absorbed solely with an absorbent sock.</p> <p>When the release is completely soaked up, discard all absorbent material as hazardous waste. Use a shovel to scoop up the loose absorbent. A chemically resistant broom and dust pan may be used to sweep up absorbent residue.</p> <p>Use a wetted absorbent pad to clean surface.</p>

Note: If radioactive materials are included in the release, the Health Physicist is contacted for an assessment and relevant swipe analysis.

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**APPENDIX D**

**Emergency Equipment List**  
**and Schedule for Testing**



## Appendix D. Emergency Equipment List and Schedule for Testing\*

Item	Building Location	Physical Description	Capabilities	Inspection Frequency	Responsible Person/ Group
Telephones	See Figures 7-1 through 7-5	Touch tone telephone	Calling supervisor, emergency dispatcher, or other key personnel; and to access paging system throughout the facility	Weekly	Hazardous Waste Management Facility Supervisor
Area 514 Facility Paging System	Area 514 Facility	Activated by dialing a designated number on a touch tone telephone; will be operational in February 1992	Audio notification of an emergency to Area 514 Facility personnel; may communicate an evacuation order.	Weekly	Hazardous Waste Management Facility Supervisor
LLNL Emergency Public Address System	All buildings and the Area 612 Facility Yard have speakers	This PA System was fabricated for LLNL; audible from any point at the laboratory	Site-wide or selected area voice information system.	Annual	LLNL Plant Engineering
Radio pagers	Worn by all operations personnel who handle hazardous waste at all Hazardous Waste Management Facilities	Small, battery operated, personnel radio pagers worn by Hazardous Waste Management operations personnel.	Informing personnel that they should call a certain extension for instructions	Daily (when-in-use)	Hazardous Waste Management Operations Personnel
Eye Wash Stations	See Figures 7-1 through 7-5	Two soft-spray outlet heads equipped with float-off dust covers to keep out contaminants.	Used to flush irritants and/or toxics from the eyes without causing further injury.	Weekly	Hazardous Waste Management Facility Supervisor
Emergency Showers	See Figures 7-1 through 7-5	High visibility ABS plastic shower head with IPS stay-open ball valve	Used to wash irritants and/or toxics from skin without causing further injury	Weekly	Hazardous Waste Management Facility Supervisor
Feed Tank Pump Interlocks	Each tank in the Area 514 Facility	The interlock is connected to a selector switch on the control panel and to the pump below the Area 514 Waste Water Treatment Tank Farm Unit; the interlock is float actuated. The filter basin of the Area 514 Waste Water Filtration Unit also contains an interlock system	If the liquid rises within the tank to the prescribed freeboard limit (1,390 gal to maintain a 2 ft freeboard) the feed interlock trips, shuts down the pump and no additional liquid can enter the tank. A similar interlock device is connected with the Area 514 Storage Tank 514-R501 Unit (which is set at 13,850 gal).	Daily when in use	Hazardous Waste Management Operations

\*Maintenance performed as necessary based upon inspection results.

## Appendix D. Emergency Equipment List and Schedule for Testing (Continued)

Item	Building Location	Physical Description	Capabilities	Inspection Frequency	Responsible Person/ Group
High-Level Alarms	Area 514 Facility Tanks	The Area 514 Waste Water Treatment Tank Farm Unit contains both an audible alarm and a visible warning light that is located on the control panel (in Building 514); these are float actuated. The Area 514 Storage Tank 514-R501 Unit also contains an audible alarm and a visible warning light in the northwest corner of the unit; these warning devices are float actuated. The filter basin of the Area 514 Waste Water Filtration Unit also contains an audible alarm system.	If the liquid rises within the tank to the prescribed freeboard level, the audible alarm sounds and the visual warning light illuminates	Daily (when-in-use)	Hazardous Waste Management Facility Supervisor
Respirators	Building 514 Hallway between Rooms 115 and 107	At a minimum the respirator locker is stocked with nine MSA full-face air purifying respirators with AGOV/HEPA cartridges** Three small Three medium Three large	Generally maintained for planned work but can also be used in emergency response situations	Daily (when-in-use - users inspect each respirator prior to use)  Monthly (integrity check on stored respirators)  Replenished as used	Respirator user  Respirator custodian  Respirator custodian
Self-Contained Breathing Apparatus (SCBA)	Hallway by Room 107	Two Survivair Mark II SCBA respirators	Provides breathable air to personnel during an emergency or planned work	Quarterly	Bldg. T6179
Emergency Personal Protective Equipment	See Figures 7-1 through 7-5	See Section 7.4.4	Protect personnel from exposure to hazardous constituents. Generally maintained for planned work but can also be used in emergency response situations.	Checked on a weekly basis	Hazardous Waste Management Support Services Supervisor

\*\* Additional respirators (with a variety of cartridges) can be immediately delivered by the LLNL Respirator Shop, if necessary. For Levels 2, 3, or 4 incidents, the LLNL Fire Department brings its own supply of respirators.

## Appendix D. Emergency Equipment List and Schedule for Testing (Continued)

Item	Building Location	Physical Description	Capabilities	Inspection Frequency	Responsible Person/ Group
Emergency Assembly Point Kit (Self-Help Kit)	See Figures 7-1 through 7-5 Weather-proof box	See Section 7.4.5	Contains first aid and other emergency equipment to be used in the event of an emergency	Monthly	Hazardous Waste Management Support Services Supervisor
Emergency Electric Generators and Flood Lights	Portable generators in B419 and in the Release Response Trailer in B612 yard	Gas-powered portable electricity generators (1500 watt/3 hp)	Provides electricity for emergency lighting or equipment	Monthly	Hazardous Waste Management Support Services Supervisor
Emergency Lighting	B612 Room 107	Dual beam battery pack	Provides lighting during power outages or emergency situations	Monthly	Hazardous Waste Management Support Services Supervisor
Berms and secondary containment	Area 514 Facility	Cement, asphalt, and other engineering control structures used to store and provide containment of wastes during normal operations and emergencies	Physical barriers used to segregate, store, and contain wastes	Weekly	Hazardous Waste Management Facility Supervisor
Portable Pumps	Area 612 or 514 Facilities Pump-out truck	Gas- and diesel-powered trash pumps in various sizes	Used to remove standing water from berms and to pump out tanks and sumps Portable pumps are stored in various containers in the Area 612 and 514 facility	Monthly	Hazardous Waste Management Support Services Supervisor
Auxiliary Fire Hoses (1.5-in. Water Hook-ups)	Building 514 (east side)	1.5-inch hose connections compatible with standard Fire Department hoses	Normally used for everyday operations but can be used as backup fire hoses, if necessary	Monthly	Hazardous Waste Management Support Services Supervisor
Decontamination Equipment	Support Services Group Equipment Yard (located north of B419)	Steam cleaner, pressure washer	Cleaning up residue in areas which came in contact with released hazardous, radioactive, or mixed wastes.	Monthly	Hazardous Waste Management Support Services Supervisor
	Building 514 Room 110	Wet/dry vacuum, squirt bottles, wipes, cleaning solutions, buckets, and rags	Used to help decontaminate and clean up small Level 1 releases and for routine decontamination operations	Weekly	Hazardous Waste Management Facility Supervisor

### Appendix D. Emergency Equipment List and Schedule for Testing (Continued)

Item	Building Location	Physical Description	Capabilities	Inspection Frequency	Responsible Person/ Group
Release Response Trailer	Parked on the north side of the Area 612-2 Container Storage Unit	Trailer stocked with bulk emergency release response equipment	Backup to LLNL Fire Department for large release mitigation	Weekly	Hazardous Waste Management B612 Facility Supervisor
Vehicles, Forklifts,	Area 514 Facility	Operational equipment used in the handling and movement of waste containers; may also be used in emergency situations	Transportation vehicles lifting devices and other equipment that transports waste	Monthly	Hazardous Waste Management Support Services
Fire Extinguishers	See Figures 7-1 through 7-5	Manually operated, portable devices that will discharge an extinguishing agent when properly activated. Lightweight aluminium or Heavy-duty steel cylinders (depending on “type” of extinguisher) which are corrosion and impact resistant with polyester/epoxy paint finish Average weight— 20 to 25 lb	Fire extinguishers are used to control small fires during the time between discovery and arrival of the LLNL Fire Department. Type A extinguishers are used to control fires starting from ordinary combustibles (i.e., paper or wood) and usually contain water. Type ABC extinguishers are used to control fires starting from either ordinary combustibles, flammable liquids, or electrical and usually contain monammonium phosphate. Type BC extinguishers are used to control fires starting from either flammable liquids or electrical and usually contain Purple K Powder (potassium bicarbonate), sodium bicarbonate, CO <sub>2</sub> , or Halon. Type D (metal-x) extinguishers are used to control fires starting from flammable metals (i.e., magnesium) and usually contain sodium chloride.	Weekly	Hazardous Waste Management Facility Supervisor
				Annual	LLNL Fire Department

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**APPENDIX E**

**Emergency Spill Kit Supplies for**

**the Area 514 Facility**



## Appendix E. Emergency Spill Kit Supplies for the Area 514 Facility

Unit	Quantity	Item/Specifications	Capabilities	Limitations
Each	3	Chemically resistant protective coveralls (Chemrel or equivalent)	Provides for chemical and abrasion resistance. Resistant to acids (including hydrofluoric), caustics (including sodium hydroxide 50%), organic solvents (including acetone 90%), PCBs, petroleum oils, and many other chemicals. Elastic wrists and ankles provide splash protection.	Disposable coverall designed for limited contact during chemical response activities. Limited breakthrough protection for: ethers (1 min), bromine liquid 99% (3 min), chloroform 99% (4 min), carbon disulfide (5 min), methylene chloride 99% (5 min).
Each	3	Face shields with clear windows (polycarbonate shield)	Chemically resistant face shield for splash protection. Complies with ANSI Z87.1-1989.	Must be worn with safety glasses.
Each	3	Goggles, clear (chemically resistant, polycarbonate lens)	Provides resistance and splash protection against mild acids, caustics, aromatic hydrocarbons, and methylene chloride. Complies with ANSI Z87.1-1989.	Provides limited vapor protection. Does not provide complete face protection; eye protection only.
Pair	8	Gloves, neoprene	Case-hardened latex neoprene provides exceptional protection against abrasions, cuts, punctures, and a wide range of chemicals. Suggested for petrochemicals, degreasers, oils, acids, caustics, alcohols, and solvents.	Limited breakthrough protection for acetone (12 min), chloroform (12 min), methylene chloride (6 min), toluene (14 min), and trichloroethylene (11 min).
Pair	8	Gloves, poly laminate (Silver Shield®, Safety 4-H or equivalent)	Recommended for immediate response situations involving morpholine, vinyl chloride, acetone, ethyl ether, solvents, and caustics. Breakthrough time for most chemicals is >6 hr (except for methylamine and ethylamine).	Provides limited protection when in contact with ethylamine (70%) and methylamine (40%). (Always use with Neoprene gloves)
Pair	6	Booties, plastic clear, impervious (polyethylene, disposable)	May be used for contamination control, to be worn over protective safety boots. Low concentrations of liquids and vapors, PCBs.	Avoid contact with halogenated hydrocarbons and aromatic hydrocarbons.
Each	6	Absorbent socks (polyester sock filled with polyethylene absorbent specifically designed for acids, bases, solvents, and other aggressive chemicals).	Rapidly absorbs concentrated acids, bases, and solvents, as well as the following: hydraulic fluids, oils, PCBs, organic solvents (e.g., acetone), and coolants. Especially designed for nitric acid, caustics, sodium hydroxide, and most acids (including hydrochloric and sulfuric).	Formaldehyde solutions not to exceed 37%. Strong oxidizing agents may degrade product over an extended period of time.

## Appendix E. Emergency Spill Kit Supplies for the Area 514 Facility (Continued)

Unit	Quantity	Item/Specifications	Capabilities	Limitations
Bag	2	Absorbent, 25 lb (Floor Dry or calcined chemically inert diatomaceous earth)	For use as an all purpose oil, grease, and water absorbent. Essentially dust free.	Do not use with hydrofluoric acid or hot alkali solutions.
Package	2	Acid neutralizer (magnesium oxide, sodium bicarbonate, Neutrasorb, or Kolor-Safe acid)	Neutralizes many mineral and organic acids including sulfuric, hydrochloric, and nitric.	May be used for hydrofluoric acid up to 48%.
Package	2	Caustic neutralizer (Spill-x-c, Neutracit, Kolor-Safe base, or equivalent)	For use on many caustics including sodium hydroxide 50% and ammonium hydroxide 29%.	Limited use for 29%–50% concentrations of caustics. Not recommended for acids, solvents.
Each	1	Drum uprighting tool (drum upender, steel construction equipped with 1.5 in. hook)	Tool to provide leverage to lift drums that have been tipped over to move from horizontal to standing position.	No limitations given. (This is a nonsparking tool)
Each	1	Drum repair kit (Lab Safety Supply Series “D” or equivalent)	Fast, temporary repairs for leaking drums. Restrains all common container leaks due to punctures, cracks, or deterioration. Includes items such as hose tape, seals for pinhole punctures, rubber patches, lead wool and epoxy putty for cracks, “T” bolt patches with neoprene pads, plugs, ball plugs, and felt-covered wooden plugs.	Designed for temporary restraint and repairs to drums only. Does not provide long-term repair.
Each	1	Shovel, plastic, short handle (chemically resistant, nonsparking polypropylene)	Provides for cleanup of absorbent and solids. Resists damage from chemicals and corrosion.	Contains no antistatic agent.
Each	1	Broom handle for push broom	To be used with broom head for sweeping absorbents.	Not applicable.
Each	1	Broom head, push (chemically resistant)	Broom has polyethylene head with chemically resistant polypropylene bristles that will not absorb liquids.	Avoid contact with halogenated hydrocarbons and aromatic hydrocarbons.
Each	2	Broom, shop, rattail (chemically resistant)	Broom has polyethylene head with chemically resistant polypropylene bristles that will not absorb liquids.	Avoid contact with halogenated hydrocarbons and aromatic hydrocarbons.
Each	2	Dust pan (chemically resistant, polyethylene)	To be used in conjunction with brooms for cleanup of absorbent or solids.	Avoid contact with halogenated hydrocarbons and aromatic hydrocarbons.

## Appendix E. Emergency Spill Kit Supplies for the Area 514 Facility (Continued)

Unit	Quantity	Item/Specifications	Capabilities	Limitations
Each	1	Ratchet, 1/2-in. drive with 15/16-in. socket	Used to remove bolts from rings on ring-top drum.	Must be used with standard drum-ring bolts.
Each	1	Wrench, bung, non-sparking	Used for tightening and loosening drum fittings.	Must be used on standard drum plugs and fittings.
Roll	1	Tape, caution: "Caution Do Not Enter" (heavy-duty, polyethylene)	Alerts workers and bystanders of hazardous areas or dangerous conditions.	Not applicable.
Each	6	Bag, poly, 3 ft by 5 ft (heavy-duty 6 mil polyethylene bags)	To contain and dispose of used absorbent materials associated with spill cleanup.	Avoid contact with halogenated hydrocarbons and aromatic hydrocarbons.
Each	1	Marker, paint tip, black	All purpose labeling pen, writes on plastic, glass, ceramic, metal, rubber, leather, film, and wax paper. Permanent, fadeproof, smudgeproof.	Not applicable.
Pack	1	Paper, pH (general purpose 0–13)	Provides quick and accurate determination of acids and bases in the field. Range 0–13.	Recommended for pH determinations between 0–13. Accuracy $\pm 0.5$ pH unit.
Box	2	Wipes (Kaydry or equivalent)	Soft cellulose fibers absorb water, solvents, and oils.	Combustible.
Each	1	Flashlights with batteries	Provides emergency lighting in areas of low visibility.	Batteries are checked and replaced as needed on a quarterly basis.
Roll	1	2 in. tape (duct or vinyl)	Seals protective clothing.	Not applicable.



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# **APPENDIX F**

## **Decontamination Agents**



## Appendix F. Decontamination Agents

Contaminant	Localized Area	Widespread Area
Radioactive materials	<ol style="list-style-type: none"> <li>1. Brush and detergent*</li> <li>2. Mild acid solution<sup>†</sup></li> <li>3. Top layer removal<sup>†</sup></li> </ol>	<ol style="list-style-type: none"> <li>1. High-pressure steam and water</li> <li>2. Mild acid solution<sup>†</sup></li> <li>3. Top layer removal<sup>†</sup></li> </ol>
Metals	<ol style="list-style-type: none"> <li>1. Brush and detergent*</li> <li>2. Chelating agent (EDTA disodium salt)</li> <li>3. Top layer removal</li> </ol>	<ol style="list-style-type: none"> <li>1. High-pressure steam and water</li> <li>2. Chelating agent (EDTA disodium salt)<sup>†</sup></li> <li>3. Top layer removal<sup>†</sup></li> </ol>
Oil and grease	<ol style="list-style-type: none"> <li>1. Brush and detergent*</li> <li>2. High-pressure steam and water<sup>†</sup></li> <li>3. High-pressure steam with trisodium phosphate<sup>†</sup></li> </ol>	<ol style="list-style-type: none"> <li>1. High-pressure steam and water</li> <li>2. High-pressure steam with trisodium phosphate<sup>†</sup></li> <li>3. Top layer removal<sup>†</sup></li> </ol>
Solvents and organic compounds	<ol style="list-style-type: none"> <li>1. Brush and detergent*</li> </ol>	<ol style="list-style-type: none"> <li>1. High-pressure steam and water</li> <li>2. High-pressure steam with trisodium phosphate<sup>†</sup></li> </ol>
PCBs	<p>Decontamination of impervious surfaces (e.g., metal) using appropriate solvent in accordance with 40 CFR 761.79</p> <ol style="list-style-type: none"> <li>a. Any PCB container to be decontaminated shall be decontaminated by flushing the internal surfaces of the container three times with a solvent. The solubility of PCBs in the solvent must be five percent or more by weight. Each rinse shall use a volume of the normal equal to approximately ten (10) percent of the PCB container capacity. The solvent may be reused for decontamination until it contains 5 ppm PCB. The solvent shall then be disposed of as a PCB in accordance with provisions of 761.60(a) 4 and CCR, Title 22.</li> <li>b. Moveable equipment used in storage areas shall be decontaminated by swabbing surfaces that have contacted PCBs with a solvent meeting the criteria of paragraph (a) of this section.</li> </ol> <p>Note: Precautionary measures should be taken to ensure that the solvent meets safety and health standards as required by applicable Federal regulations.</p>	<ol style="list-style-type: none"> <li>1. High-pressure steam or water</li> <li>2. High-pressure steam with trisodium phosphate<sup>†</sup></li> <li>3. Remove soil, asphalt, and top layer of cement<sup>†</sup></li> </ol>

\* Detergent to be used must contain trisodium phosphate.

<sup>†</sup> Only to be used if first procedural step fails to remove contamination.

### References:

Unterberg, W., R. W. Melvoid, *et al.* (1989), *Reference Manual of Countermeasures for Hazardous Substance Release*, Hemisphere Publishing.

Esposito, M. P., *et al.* (1987), *Decontamination Techniques for Buildings, Structures and Equipment*, Noyes Data.